Vol. 1098 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

January 17, 1989

U.S.
DEPARTMENT
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

January 17, 1989 Volume 1098 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

The withdrawal of the Norwegian declaration under PCT Article 64(1)(a), that Norway shall not be bound by PCT Chapter II, as from Jan. 1, 1989, was announced at 1096 O.G. 34 on Nov. 22, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

Oct. 26, 1988.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct.

5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 14, 1986 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,563,776 through 4,564,955
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 12, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,309,774 through 4,310,924
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 30, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,479,268	06/381,559	10/30/84
4,479,270	06/310,639	10/30/84
4,479,276	06/291,702	10/30/84
4,479,278	06/351,857	10/30/84
4,479,281	06/460,670	10/30/84
4,479,285	06/310,209	10/30/84
4,479,287	06/361,896	10/30/84
4,479,288	06/456,375	10/30/84
4,479,295	06/248,486	10/30/84
4,479,300	06/475,279	10/30/84
4,479,302	06/514,558	10/30/84
4,479,317	06/424,529	10/30/84
4,479,318	06/447,540	10/30/84
4,479,321	06/441,612	10/30/84
4,479,323	06/462,317	10/30/84
4,479,334	06/331,535	10/30/84
4,479,335	06/521,153	10/30/84
4,479,344	06/363,813	10/30/84
4,479,347	06/409,413	10/30/84
4,479,348	06/435,888	10/30/84
4,479,353	06/419,268	10/30/84
4,479,358	06/498,866	10/30/84
4,479,362	06/448,560	10/30/84
4,479,365	06/521,427	10/30/84
4,479,374	06/469,137	10/30/84
4,479,377	06/478,319	10/30/84
4,479,379	06/497,902	10/30/84
4,479,382	06/365,593	10/30/84
4,479,384	06/494,208	10/30/84
4,479,401	06/314,287	10/30/84
4,479,403	06/504,239	10/30/84
4,479,406	06/583,614	10/30/84
4,479,414	06/419,984	10/30/84
4,479,420	06/348,105	10/30/84
4,479,423	06/553,979	10/30/84
4,479,427	06/498,892	10/30/84
4,479,438	06/463,233	10/30/84
4,479,449	06/484,912	10/30/84
4,479,452	06/420,284	10/30/84
4,479,457	06/435,985	10/30/84
4,479,460	06/443,601	10/30/84
4,479,465	06/490,456	10/30/84
4,479,487	06/501,114	10/30/84
4,479,491	06/401,845	10/30/84
4,479,502	06/454,400	10/30/84
4,479,503	06/514,896	10/30/84
4,479,514	06/386,122	10/30/84
4,479,522	06/405,830	10/30/84
4,479,524	06/425,179	10/30/84
4,479,533	06/267,537	10/30/84
4,479,546	06/461,991	10/30/84
4,479,548	06/476,442	10/30/84
4,479,553	06/349,586	10/30/84
4,479,554	06/389,452	10/30/84
4,479,563	06/444,680	10/30/84
4,479,584	06/297,850	10/30/84
4,479,593	06/396,832	10/30/84
4,479,602	06/289,848	10/30/84
4,479,610	06/386,261	10/30/84
4,479,622	06/466,476	10/30/84
4,479,627	06/465,563	10/30/84

Patent Number	Serial Number	Issue Date
4,479,628	06/353,614	10/30/84
4,479,630	06/466,254	10/30/84
4,479,632	06/375,053	10/30/84
4,479,640	06/517,080	10/30/84
4,479,649	06/499,985	10/30/84
4,479,651	06/419,966	10/30/84
4,479,653	06/501,823	10/30/84
4,479,654	06/384,771	10/30/84
4,479,660	06/430,046	10/30/84
4,479,661	06/395,285	10/30/84
4,479,663	06/382,183	10/30/84
4,479,664	06/320,532	10/30/84
4,479,675	06/459,473	10/30/84
4,479,684	06/392,357	10/30/84
4,479,688	06/334,148	10/30/84
4,479,689	06/430,892	10/30/84
4,479,702	06/395,443	10/30/84
4,479,713	06/489,201	10/30/84
4,479,721	06/321,328	10/30/84
4,479,729	06/502,512	10/30/84
4,479,735	06/457,787	10/30/84
4,479,739	06/268,335	10/30/84
4,479,741	06/371,730	10/30/84
4,479,743	06/504,538	10/30/84
4,479,745	06/375,578	10/30/84
4,479,754	06/394,773	10/30/84
4,479,755	06/370,919	10/30/84
4,479,765	06/427,650	10/30/84
4,479,769	06/247,051	10/30/84
4,479,775	06/418,419	10/30/84
4,479,782	06/485,889	10/30/84
4,479,785	06/400,152	10/30/84
4,479,822	06/406,897	10/30/84
4,479,835	06/384,012	10/30/84
4,479,845	06/388,198	10/30/84
4,479,849	06/498,934	10/30/84
4,479,862	06/569,141	10/30/84
4,479,873	06/456,671	10/30/84
4,479,882	06/458,583	10/30/84
4,479,891	06/502,206	10/30/84
4,479,892	06/494,970	10/30/84
4,479,918	06/366,242	10/30/84
4,479,929	06/448,200	10/30/84
4,479,935	06/254,254	10/30/84
4,479,939	06/445,420	10/30/84
4,479,940	06/341,335	10/30/84
4,479,946	06/378,852	10/30/84
4,479,964	06/256,879	10/30/84
4,479,993	06/434,237	10/30/84
4,479,996	06/287,574	10/30/84
4,479,999	06/368,491	10/30/84
4,480,000	06/388,632	10/30/84
4,480,027	06/438,937	10/30/84
4,480,031	06/446,258	10/30/84
4,480,045	06/587,855	10/30/84
4,480,051	06/519,991	10/30/84
4,480,053	06/382,217	10/30/84
4,480,055	06/352,721	10/30/84
4,480,099	06/390,353	10/30/84
4,480,104	06/466,695	10/30/84
4,480,106	06/435,593	10/30/84
4,480,113	06/425,787	10/30/84
4,480,127	06/496,371	10/30/84
4,480,140	06/475,719	10/30/84
4,480,149	06/447,248	10/30/84
4,480,158	06/466,936	10/30/84
4,480,161	06/488,234	10/30/84
4,480,162	06/352,410	10/30/84
4,480,163	06/455,753	10/30/84
4,480,176	06/401,640	10/30/84
4,480,179	06/420,628	10/30/84
4,480,181	06/451,533	10/30/84
4,480,188	06/402,044	10/30/84
4,480,197	06/274,283	10/30/84
4,480,223	06/324,836	10/30/84
4,480,224	06/332,549	10/30/84
4,480,247	06/425,677	10/30/84
4,480,252	06/330,139	10/30/84
4,480,269	06/462,215	10/30/84
4,480,270	06/316,015	10/30/84
4,480,281	06/431,478	10/30/84
4,480,286	06/342,580	10/30/84
4,480,290	06/493,006	10/30/84
4,480,291	06/532,004	10/30/84
4,480,294	06/447,122	10/30/84
4,480,297	06/480,688	10/30/84
4,480,312	06/293,019	10/30/84
4,480,315	06/408,404	10/30/84
4,480,327	06/559,167	10/30/84
4,480,332	06/374,124	10/30/84
4,480,334	06/389,051	10/30/84

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,622,959, Re. S.N. 273,270, Filed Nov. 18, 1988, Cl. 128/92 YZ, MULTI-USE FEMORAL INTRAMEDULLARY NAIL, Randall E. Marcus, Owner of Record: *Inventor,* Attorney or Agent: Roy F. Hollander, Ex. Gp.: 331

4,623,076, Re. S.N. 272,525, Filed Nov. 17, 1988, Cl. 222/482, REFILLABLE CONTAINER WITH DEPRESSURIZATION MEAN, David Karpal, Owner of Record: *Inventor,* Attorney or Agent: Bernard L. Kleinke, Ex. Gp.: 311

4,637,693, Re. S.N. 258,839, Filed Oct. 12, 1988, Cl. 350/536, MICROSCOPE INSPECTION SLIDE, Vance C. Mitchell, Owner of Record: *ICL Scientific, Fountain Valley, Calif.,* Attorney or Agent: Edward S. Irons, Ex. Gp.: 350

4,673,458, Re. S.N. 271,710, Filed Nov. 16, 1988, Cl. 156/695, METHOD FOR PREPARING A PRINTED CIRCUIT BOARD, Katsukiyo Ishikawa, et al., Owner of Record: *Nippon Paint Co. Ltd., Osaka, Japan,* Attorney or Agent: John T. Miller, Ex. Gp.: 131

4,693,124, Re. S.N. 260,590, Filed Oct. 21, 1988, Cl. 73/863.11, A TEMPERATURE CONTROLLING APPARATUS FOR USE WITH PORE VOLUME AND SURFACE AREA ANALYZERS, Graham R. Killip, et al., Owner of Record: *Micromeritics Instrument Corp., Norcross, Ga.,* Attorney or Agent: Jeffrey E. Young, Ex. Gp.: 265

4,746,081, Re. S.N. 275,095, Filed Nov. 22, 1988, Cl. 244/89, AIRCRAFT, Alessandro Mazzoni, Owner of Record: *Industrie Aeronautiche E. Rinaldo Piaggio S.P.A., Enova, Italy,* Attorney or Agent: Robert M. Hessin, Ex. Gp.: 315

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,379,696, Reexam. No. 90/001,658, Requested: Dec. 1, 1988, Cl. 434/98, LATEX MYLAR CHIP, Stanley Lerner, Owner of Record: *Color Communications Inc., Chicago, Ill.,* Attorney or Agent: John F. Flannery, Ex. Gp.: 150, Requester: Owner

4,503,095, Reexam. No. 90/001,655, Requested: Dec. 1, 1988, Cl. 427/265, HEAT-SENSITIVE COLOR TRANSFER RECORDING MEDIA, Tadao Seto, et al., Owner of Record: *Fuji Kagokushi Kogyo Co., Osaka, Japan,* Attorney or Agent: R. J. Kubovcik, Ex. Gp.: 150, Requester: James J. Brown, Rockville, Md.

4,574,859, Reexam. No. 90/001,659, Requested: Dec. 5, 1988, Cl. 152/410, RIM ASSEMBLY, William T. Smith, Owner of Record: *Dotson Wheel Corp., Inc., Saltville, Va.,* Attorney or Agent: William J. Waugaman, Ex. Gp.: 310, Requester: Owner

4,618,332, Reexam. No. 90/001,656, Requested: Nov. 30, 1988, Cl. 474/80, DERAILLEUR FOR A BICYCLE, Masahi Nagano, Owner of Record: *Bank of New England, Boston, Mass.,* Attorney or Agent: Stevens, Davis, et al., Ex. Gp.: 350, Requester: Shimano Industrial Co., Osaka, Japan

4,653,360, Reexam. No. 90/001,657, Requested: Dec. 1, 1988, Cl. 82/18, CNC TURNING MACHINE, Ronald E. Compton, Owner of Record: *The Cross Co., Fraser, Mich.,* Attorney or Agent: R. J. Eifler, Ex. Gp.: 320, Requester: Owner

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Registration to Practice

The results of the examination for registration to practice before the United States Patent and Trademark Office held on Oct. 12, 1988 were mailed to 460 candidates. The following list contains the names of persons who successfully passed the examination. Persons entitled at this time to receive provisional recognition pursuant to 37 CFR 10.9(a) have been given the same to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before Feb. 12, 1989.

Adams, Charles E., 307 Wesley Dr., Chapel Hill, N.C. 27516
Alexander, David J., 2817 Silverglade, Oklahoma City, Okla. 73120
Andes, William F., Jr., 6 Waterview Ct., Riverhead, N.Y. 11901
Appleby, Vanessa L., 424 S. Buena Vista Ave., San Jose, Calif. 95126
Arrett, Richard A., 2387 Unity Ave. N., Golden Valley, Minn. 55422
Auyang, Hunter Ling, 1722 19th St., NW., #211, Washington, D.C. 20009
Barber, William G., 30 Lone Oak Trail, Austin, Tex. 78745
Barker, Bruce, J., 121 Garrison Ave., #303, Jersey City, N.J. 07306
Barr, Karl F., Jr., 844 Bedford Rd., Grosse Pointe Pk., Mich. 48230
Belcher, Gordon F., 7552 Oxford Dr., Apt. 3D, Clayton, Mo. 63105
Bellomy, Robert M., 540-C NE., Northgate Way, Seattle, Wash. 98125
Bielawski, W. Mark, 11 Second St., NE., #104, Washington, D.C. 20002
Bloomberg, Mark H., 181 Glendale Rd., Scarsdale, N.Y. 10583
Boots, Daniel Lee, 5333 Fallwood Dr., Apt. 114, Indianapolis, Ind. 46204
Borgman, Steven R., 2523 Swift, Houston, Tex. 77030
Bowersox, Leonard D., 5321 Weymouth Dr., Springfield, Va. 22151
Breiner, Mary J., 115 N. Henry St., Alexandria, Va. 22314
Buchenhorner, Michael J., 7614 Matera St., Apt. 104, Falls Church, Va. 22043
Burns, Ian F., P.O. Box 210, Glenbrook, Nev. 89413
Caspers, Philip P., 210 Bedford St., SE., Minneapolis, Minn. 55414
Castaneda, Janet K., 440 32nd Ave., San Francisco, Calif. 94121
Connors, Matthew E., 5392 Harbor Court Dr., Alexandria, Va. 22310
Coppiellie, Raymond L., 51857 Johns, New Baltimore, Mich. 48047
Cordell, Helen S., 10325 S. Nashville Ave., Chicago Ridge, Ill. 60415
Courson, Timothy H., 1920 Senate St., St. Louis, Mo. 63118
Cronvich, James T., 625 Posey Ave., Harahan, La. 70123
Czarnik, Carey A., 8502 Tee Brook Dr., Orland Park, Ill. 60462
Daniels, Stacy Yvonne, 11445 79th St., Burr Ridge, Ill. 60525
Dawson, Todd A., 2402 Erskine Blvd., South Bend, Ind. 46614
De Leon, Josefino P., 9503 Brian Jac La., Great Falls, Va. 22066
DeLuca, Mark, 3165 Stonebridge, #7, Portage, Mich. 49002
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CAMERON WEIFFENBACH,
Dec. 21, 1988 *Director, Office of Enrollment and Discipline.*

National Inventors Expo

The Patent and Trademark Office, the National Council of Intellectual Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc. will sponsor the Seventeenth Annual National Inventors Expo in the Public Search Rm. on Saturday, Feb. 11, 1989 from 1:00 to 5:00 p.m. and Sunday, Feb. 12, 1989 from 10:00 to 5:00 p.m. The Public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 12 at 2:00 p.m.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 10, 1989 at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

DONALD J. QUIGG,
Dec. 22, 1988 *Assistant Secretary and Commissioner of Patents and Trademarks.*

Department of Commerce
Patent and Trademark Office
37 CFR Part 10

[Docket No. 81146-8246]

Exhaustion of Administrative Remedies in Patent and Trademark Office Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce
Action: Notice of Proposed Rulemaking
Summary: This notice of proposed rulemaking sets forth proposed amendments to 37 CFR 10.155 and 10.157. The purpose of the amendments is to clarify that a respondent dissatisfied with the initial decision by the administrative law judge in a Patent and Trademark Office (PTO) disciplinary proceeding must exhaust available administrative remedies, i. e., appeal to the Commissioner of Patents and Trademarks, before seeking judicial review under 35 U.S.C. §32. Interested parties are invited to comment on the proposed amendments.
Dates: Written comments must be received on or before Feb. 27, 1989 to ensure consideration. No oral hearing will be conducted.
Address: Address written comments to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Harris A. Pitlick.
For Further Information Contact: Harris A. Pitlick by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231
Supplementary Information: It is possible that present rules may be interpreted not to explicitly require a respondent dissatisfied with the desicion of the administrative law judge (initial decision) in a PTO disciplinary proceeding to file an appeal with the Commissioner of Patents and Trademarks as a condition precedent to filing a petition for review in the United States District Court for the District of Columbia under 35 U.S.C. §32.

Under present 37 CFR 10.154(a), in the absence of an appeal to the Commissioner, the initial decision will, without further proceedings, become the decision of the Commissioner thirty (30) days therefrom. Under 35 U.S.C. §32, Local Rule 213 of the United States District Court for the District of Columbia and present 37 CFR 10.157, review of the final decision of the Commissioner may be obtained by filing a petition in that court within 30 days of the date of final agency action. Thus, as presently constituted, the rules could be construed to permit a respondent dissatisfied with the initial decision to bypass review by the Commissioner and directly seek judicial review within 60 days of the date of the initial decision.

The purpose of 37 CFR 10.154-10.157 is to outline the steps for seeking review of an initial decision in a disciplinary proceeding. There is no provision for bypassing a determination by the Commissioner unless both parties accept the decision and do not desire any further review of the initial decision. 37 CFR 10.155 amd 10.157 are propsed to be amended to clarify that a respondent must exhaust available administrative remedies by appeal to the Commissioner before judicial review can be considered ripe.

Section 10.155 is proposed to be amended by adding a new paragraph (d), which provides that absent an appeal by the Director, failure by the respondent to appeal under the provisions of this section shall be deemed to be both an acceptance of the initial decision and a waiver of the right to further administrative or judicial review.

Section 10.157 is proposed to be amended by making paragraph (a) thereof subject to paragraph (d) of 37 CFR 10.155.
Other Considerations: The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. §3501 *et seq.*

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration that this proposed rule change is not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354).

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no federalism implications affecting the relationship between the national govenment and the States as outlined in Executive Order 12612.

This proposed rule change does not contain a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. §3501 *et seq.*

List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Trademarks.

For the reasons set out in the preamble, it is proposed to amend 37 CFR Part 10 as follows wherein removals are indicated by brackets and additions by arrows:

PART 10-REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

1. The authority citation for 37 CFR Part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is proposed to be amended by adding new paragraph (d) as follows:

§10.155 Appeal to the Commissioner.

* * * * *

►(d) In the absence of an appeal by the Director, failure by the respondent to appeal under the provisions of this section shall be deemed to be both acceptance by the respondent of the initial decision and waiver by the respondent of the right to further administrative or judicial review.◄

3. Section 10.157 is proposed to be amended by revising paragraph (a) as follows:

§10.157 Review of Commissioner's final decision

(a) Review of the Commissioner's final decision in a disciplinary case may be had ►, subject to §10.155(d),◄ by a petition filed in the United States District Court for the District of Columbia. See 35 U.S.C. 32 and Local Rule 213 of the United States District Court for the District of Columbia.

Dec. 21, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 17, 1989

Re. 32,719	4,728,057	4,752,485	4,760,884
4,399,430	4,730,074	4,752,647	4,760,956
4,514,145	4,731,317	4,752,733	4,761,382
4,514,692	4,731,420	4,753,082	4,761,523
4,561,145	4,731,662	4,753,314	4,762,009
4,581,834	4,731,795	4,753,717	4,762,061
4,598,289	4,732,368	4,753,732	4,762,557
4,616,702	4,732,600	4,754,155	4,762,645
4,624,203	4,733,091	4,754,182	4,763,280
4,626,738	4,735,608	4,754,648	4,763,359
4,631,331	4,737,695	4,755,259	4,763,568
4,666,813	4,737,794	4,755,558	4,763,818
4,672,126	4,737,974	4,755,595	4,763,956
4,673,282	4,738,630	4,755,617	4,763,967
4,673,596	4,738,697	4,755,870	4,764,035
4,674,058	4,738,789	4,756,034	4,764,452
4,680,214	4,738,798	4,756,267	4,764,790
4,686,352	4,739,438	4,756,373	4,765,106
4,690,939	4,739,491	4,756,408	4,765,136
4,691,069	4,739,624	4,756,415	4,765,602
4,695,835	4,740,243	4,756,494	4,766,205
4,698,242	4,741,227	4,757,029	4,766,319
4,699,470	4,741,455	4,757,154	4,766,567
4,701,277	4,741,503	4,757,617	4,766,701
4,701,393	4,742,364	4,757,700	4,766,818
4,702,652	4,742,455	4,757,997	4,767,185
4,703,955	4,742,518	4,758,024	4,767,188
4,704,862	4,743,908	4,758,035	4,767,264
4,705,320	4,744,219	4,758,138	4,767,580
4,705,378	4,747,706	4,758,500	4,768,060
4,707,689	4,747,833	4,758,605	4,768,351
4,708,997	4,747,898	4,758,651	4,769,369
4,709,273	4,748,159	4,758,957	4,769,474
4,709,942	4,748,958	4,759,202	4,769,519
4,711,963	4,749,756	4,759,251	4,769,558
4,712,172	4,750,048	4,759,656	4,769,715
4,718,929	4,750,229	4,760,121	4,770,263
4,720,787	4,750,527	4,760,183	4,771,176
4,721,162	4,750,631	4,760,189	4,771,357
4,723,052	4,750,776	4,760,229	4,771,380
4,723,232	4,750,949	4,760,446	4,771,736
4,724,417	4,750,988	4,760,570	4,771,884
4,724,827	4,751,083	4,760,635	4,772,007
4,726,316	4,752,313	4,760,706	4,772,278
4,727,524	4,752,378	4,760,743	4,772,489

SPECIAL BOXES FOR MAIL

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Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

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The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions,* and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collec patents from either microfilm or paper collections are generallcontemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
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Nevada	Reno: University of Nevada—Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
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New Mexico	Albuquerque: University of New Mexico Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin —Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 17, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-10-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-4-87
BIOTECHNOLOGY, GROUP 180—S. N. ZAHARNA, Acting Director	1-17-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	1-20-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-8-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-27-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-28-87
DESIGN, GROUP 290—K. L. CAGE, Director	1-17-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-10-87
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—VACANT, Director	7-7-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—VACANT, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-22-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-4-88

Expiration of patents: The patents within the range of numbers indicated below expire during December 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,624,839 to 3,631,538, inclusive

Plant Patents ..... None

REEXAMINATIONS

JANUARY 17, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,096,226 (992nd)

INTEGRATED SPIN-DRAW-TEXTURIZING PROCESS FOR MANUFACTURE OF TEXTURIZED POLYAMIDE FILAMENTS

Wolfgang Martin, Ludwigshafen; Dieter Herlon, Frankenthal; Dimiter Bayew, Mannheim, and Wolfgang Bauer, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland, Pfalz, Fed. Rep. of Germany

Reexamination Request No. 90/001,269, Jun. 26, 1987.

Reexamination Certificate for Patent No. 4,096,226, issued Jun. 20, 1978, Ser. No. 796,169, May 12, 1977.

Continuation-in-part of Ser. No. 320,481, Jan. 2, 1973, abandoned.

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1972, 2200064

Int. Cl.[4] D01D *5/22, 5/12*

U.S. Cl. 264—168

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2, 3 and 7 are cancelled.

Claim 1 is determined to be patentable as amended.

Claims 4–6, dependent on an amended claim, are determined to be patentable.

New claim 8 is added and determined to be patentable.

1. In an integrated process for the manufacture of a texturized *nylon 6* yarn by [a] *the* continuous melt-spinning, drawing and texturizing of [a fiber-forming synthetic linear high molecular weight polymer selected from the group consisting of poly-ε-caprolactam and polyhexamethylene adipamide] *nylon 6 having a relative viscosity, measured on a solution of 1 g of nylon 6 in 100 ml of 96% sulfuric acid at 25° C., of between 2.4 and 3.2* wherein the steps of spinning, drawing and texturizing are combined in immediate succession, the improvement which comprises:

a. melt-spinning filaments of [said fiber-forming polymer] *nylon 6* at a temperature of between 260° C. and 295° C. and at a spin-draw melt attenuation ratio of between [1:10 and 1:60] *1:20 and 1:40;*

b. drawing the spun filaments only on forwarding elements for the development of a uniform tensile strength and modulus of elasticity, said spun filaments being collected as a bundle leaving the melt-spinning stage and directly wound on at least two forwarding elements, of which the initial elements have a surface temperature of between 50° C. and 120° C. and the final element has a surface temperature of between 80° C. and 350° C. at a draw ratio such that the drawn filaments on leaving the drawing stage, have an extensibility of between 10 and 50%; and

c. air-texturizing said filaments as a collected yarn leaving the drawing stage at a velocity of between 800 and 3,000 m/min, the overfeed in the texturizing stage being from [10 to 50%] *25 to 35%* at a filament temperature, prior to texturization, of between 50° C. and 180° C., the spinning drawing and texturizing yielding a yarn with a total final denier of from 100 to 3,600 dtex and an individual filament denier of from 3 to 30 detex.

B1 4,497,520 (993rd)

ROTATABLE CUTTING BIT

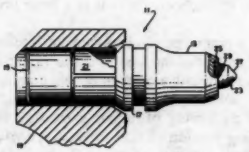
Randall W. Ojanen, Bristol, Va., assignor to GTE Products Corporation, Stamford, Conn.

Reexamination Request Nos. 90/001,242, May 18, 1987 and 90/001,451, Feb. 29, 1988.

Reexamination Certificate for Patent No. 4,497,520, issued Feb. 5, 1985, Ser. No. 489,990, Apr. 29, 1983.

Int. Cl.[4] E21C *35/18*

U.S. Cl. 299—86



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT.

Claims 1–3, 6, 11, 12, and 14 are determined to be patentable as amended.

Claims 4, 5, 7–10, 13 and 15, dependent on an amended claim, are determined to be patentable.

New claims 16–36 are added and determined to be patentable.

1. A rotatable cutting bit comprising a head portion, a shank portion depending from said head portion along a longitudinal axis, said head portion having a socket at the forward end, a hard insert having coaxially aligned and integral sections, said sections comprising a base section, a tip section, and an intermediate section contiguous said base and tip section, said base being fixedly mounted in said socket and having a first diameter, said tip section being conically shaped and having a maximum second diameter, said intermediate section having a maximum third diameter, said second and third diameters each being less than said first diameter,

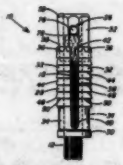
said intermediate section having a frusto-conical shape and tapering outwardly from the junction with the tip section to the junction with the base section, said intermediate section and said base forming a fillet at the juncture thereof whereby said base forms a shoulder with said intermediate section.

B1 4,516,885 (994th)

METHOD AND APPARATUS FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION

Frank Calandra, Jr., Johnstown, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.

Reexamination Request No. 90/001,347, Oct. 8, 1987.
Reexamination Certificate for Patent No. 4,516,885, issued May 14, 1985, Ser. No. 602,204, Apr. 19, 1984.
Continuation of Ser. No. 497,113, Jul. 5, 1983, which is a division of Ser. No. 209,134, Nov. 21, 1980, Pat. No. 4,419,805.
The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.
Int. Cl.[4] B23P *25/00*; F16B *13/06*
U.S. Cl. 405—261



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 2–6 is confirmed.

Claim 1 is determined to be patentable as amended. Claims 7–9, dependent on an amended claim, is determined to be patentable.

1. A method of anchoring a bolt in a bore hole comprising the steps of,

positioning a camming plug having an internally threaded bore and an outlet surface into the upper portion of an expansion shell with a portion of said camming plug outer surface in abutting relation with a portion of the inner surface of a plurality of fingers extending upwardly from a lower ring portion of said expansion shell,

positioning said expansion shell on the threaded end portion of said bolt and threadedly engaging said camming plug to the end of said threaded portion of said bolt in a manner that said camming plug is movable longitudinally on said bolt threaded portion,

inserting a bonding material into a bolt hole,

inserting said bolt with said camming plug threadedly engaged thereto into a bore hole,

rotating said [bore] *bolt* in a preselected direction while maintaining said camming plug in fixed relation with said expansion shell to thereby mix at least a portion of said bonding material, and

thereafter rotating said bolt in said same preselected direction and moving said camming plug on said bolt to expand the fingers of said expansion shell and apply a tension to said bolt in said bore hole.

B1 4,518,292 (995th)

METHOD AND APPARATUS FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION

Frank Calandra, Jr., Johnstown, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.

Reexamination Request No. 90/001,348, Oct. 8, 1987.
Reexamination Certificate for Patent No. 4,518,292, issued May 21, 1985, Ser. No. 497,113, Jul. 5, 1983.
Division of Ser. No. 209,134, Nov. 21, 1980, Pat. No. 4,419,805.
The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.
Int. Cl.[4] E21D *20/02*; F16B *13/00*; B23P *25/00*
U.S. Cl. 411—82

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–8 is confirmed.

1. A bolt assembly for securing a bolt in a bore hole having a bonding material therein comprising,

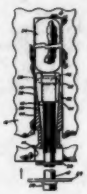
bonding material adapted to be positioned in an unmixed condition in a bore hole,

a bolt having a threaded end portion,

a camming plug having an internally threaded bore and an outer surface, said camming plug threadedly engaged to the threads adjacent the end of said bolt threaded end portion, said camming plug positioned to move axially on said bolt upon rotation of said bolt in a preselected direction,

an expandable shell having a plurality of longitudinally extending fingers,

said fingers each having an inner surface and an outer surface, a portion of said inner surface abutting a portion of



said camming plug outer surface and a portion of said finger outer surface adapted to engage the wall of said bore hole,

said expandable shell fingers arranged to expand outwardly to engage said outer surface of said fingers to the wall of said bore hole by longitudinal movement of said camming plug relative to said bolt threaded end portion and said expandable shell,

means for mixing at least a portion of said bonding material in said bore hole upon rotation of said bolt in said preselected direction in said bore hole while maintaining said expansion fingers in an unexpanded condition, and

means for moving said camming plug axially on said bolt threaded end portion and relative to said expandable shell fingers upon rotation of said bolt in said same preselected direction to expand said fingers and anchor said bolt in said bore hole.

B1 4,560,604 (996th)

METHOD OF FLOCKING TREATMENT

Goro Shimizu, and Yosuke Kitagawa, both of Ohtsu, Japan, assignors to Matsui Shikiso Chemical Co., Ltd., Japan

Reexamination Request No. 90/000,975, Mar. 26, 1986.
Reexamination Certificate for Patent No. 4,560,604, issued Dec. 24, 1985, Ser. No. 643,054, Aug. 22, 1984.
Claims priority, application Japan, Aug. 24, 1983, 58-154384
Int. Cl.[4] B05D *1/06, 1/14*
U.S. Cl. 428—87

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–2 are cancelled.

[1. A method of flocking treatment characterized by entirely or partially coating a surface of a shaped material of a synthetic resin or fibers with an adhesive having incorporated therein a thermally color-changeable particulate material, the particulate material comprising three components enclosed in a high-molecular-weight compound, the three components being an electron donating chromogenic substance, an electron accepting substance corresponding to the chromogenic substance and a solvent having a boiling point of at least 150° C. and selected from the group consisting of alcohols, amides, esters and azomethines; and electrostatically flocking the resulting adhesive layer with colored or colorless short fibers.]

REISSUES

JANUARY 17, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,830

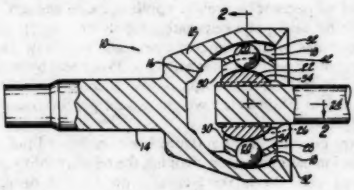
METHOD OF FORMING A PRECISION BALL TRACK

Daniel W. Hazebrook, Detroit, Mich., assignor to GKN Automotive Components Inc., Auburn Hills, Mich.

Original No. 4,611,373, dated Sep. 16, 1986, Ser. No. 801,494, Nov. 22, 1985. Continuation of Ser. No. 588,514, Mar. 12, 1984, abandoned. Application for reissue Jun. 29, 1987, Ser. No. 67,300

Int. Cl.[4] B21D *53/12;* **B21K** *1/04, 1/05;* **B23P** *13/02*

U.S. Cl. 29—148.4 C **18 Claims**



1. A method of forming a precision ball race groove track in a race member of a universal joint, said method comprising the steps of:

forming said race member with a formed ball race groove track and with a recess groove extending *substantially* along *the apex of* said formed ball race groove track, said recess groove having a base that will not come into contact with a finishing tool used to finish machine said ball race groove track; and

finish machining said formed ball race groove track to a predetermined precision shape to produce said precision ball race groove track by moving said ball race groove track into contact with the finishing tool such that the finishing tool contacts said ball race groove track to thereby finish machine said ball race groove track without coming into contact with said base of said recess groove extending along said formed ball race groove track.

Re. 32,831

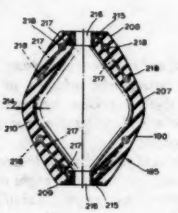
APPARATUS FOR SEALING A WELL CASING

Clinton O. Shonrock, Los Alamos, N. Mex.; John O. Wambaugh, and Joachim A. Hoppe, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Original No. 4,554,973, dated Nov. 26, 1985, Ser. No. 544,658, Oct. 24, 1983. Application for reissue Apr. 26, 1987, Ser. No. 53,985

Int. Cl.[4] E21B *33/128*

U.S. Cl. 166—135 **18 Claims**



1. An elastomeric sealing element for a bridge plug for use within a well casing and production tubing, the diameter of the production tubing being smaller than the diameter of the well casing, comprising:

a generally tubular-shaped elastomeric member having first and second ends and a unitary wall portion therebetween;

the elastomeric member having a normal, unstressed configuration, wherein the diameter thereof varies along the longitudinal axis of the elastomeric member, with the diameter intermediate the ends of the elastomeric member being larger than the diameter at the ends of the elastomeric member;

the elastomeric member being elongatable along its longitudinal axis whereby the diameter intermediate the ends of the elastomeric member is substantially the same as the diameter of its ends so that the elastomeric member may pass through the production tubing; and

the elastomeric member being compressible along its longitudinal axis to a configuration where said ends of said elastomeric member are in contact with each other whereby said unitary wall portion sealingly conforms to the well casing.

10. A through-tubing bridge plug adapted to be lowered through a tubing string in a cased well bore and set in an interval thereof below the lower end of the tubing string comprising:

an elongated body;

packer means including a plurality of tubular elastomeric sealing members mounted around said body and cooperatively arranged with their intermediate portions respectively having an external diameter larger than the diameter of their upper and lower end portions when said sealing members are in a normal, unstressed configuration so that their intermediate portions will be doubled over and flattened together in response to oppositely-directed forces compressing their upper and lower end portions together for expanding said intermediate portions of said sealing members outwardly into sealing engagement with a well bore casing;

means releasably retaining each of said sealing members on said body in an initial longitudinally-elongated configuration to temporarily reduce the diameter of said intermediate portions of said sealing members to facilitate the passage of said bridge plug through a tubing string, said retaining means being operatively arranged to release said sealing members for outward expansion of their intermediate portions into sealing engagement with a well bore casing as their upper and lower end portions are compressed together by said oppositely-directed forces;

reinforcing means including upper and lower sets of opposed reinforcing members on said body above and below said packer means and respectively having petal-like projections disposed around said body and normally inclined outwardly therefrom, each set of said opposed reinforcing members having their respective projections angularly aligned with one another so that as said oppositely-directed forces move said reinforcing members toward said packer means, said projections will be swung away from said body through an arc of less than 90-degrees to laterally-extended positions where their opposed faces will be coengaged against one another for supporting said end portions of said sealing members against further longitudinal movement; and

upper and lower anchoring means cooperatively arranged on said body above and below said reinforcing means for movement into anchoring engagement with a well bore casing after said intermediate portions of said sealing members are expanded outwardly into sealing engagement therewith.

Re. 32,832

TEMPORARY OBTURATION PANEL OF A PASSAGE INSIDE A VESSEL ACCESSIBLE ONLY THROUGH AN ORIFICE OF SMALLER SIZE

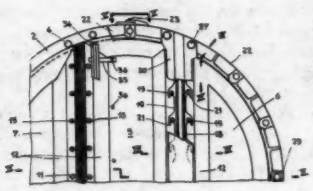
Jean Coussau, Paris, and Claude Lavaleric, L'Isle Adam, both of France, assignors to Framatome & Cie., Courbevoie, France

Original No. 4,600,115, dated Jul. 15, 1986, Ser. No. 667,192, Nov. 1, 1984. Application for reissue Apr. 13, 1987, Ser. No. 37,903

Claims priority, application France, Nov. 2, 1983, 83 17391

Int. Cl.[4] B65D *45/00*

U.S. Cl. 220—327 4 Claims



1. Temporary fluid-tight obturation panel for a passage into a vessel accessible only through an aperture of dimensions less than those of the passage to be obturated, the periphery of the passage to be closed comprising a support collar provided with threaded holes, said obturation panel being constituted by:

at least two panels articulated together by flexible fluid-tight hinges, the size and number of panels being determined to enable passage through the access aperture of the set of panels folded on one another, each panel comprising along its articulated edges a series of latching pins,

a set of stiffeners equal in number to that of the hinges of the panel, each stiffener comprising two lines of holes conjugate with the lines of the latching pins of two contiguous panels,

a frame in at least two parts articulated and foldable on one another, reproducing in folded position the contour of the support collar and comprising means to grip, with the interposition of a seal, the ends of the panels and of the stiffeners against the support collar, by screwing into the threaded holes.

Re. 32,833

SCREENING VACCINES AND IMMUNIZATION PROCESS

Mark I. Greene, Penn Valley, Pa., and Bernard N. Fields, West Newton, Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Original No. 4,490,358, dated Dec. 25, 1984, Ser. No. 353,257, Mar. 1, 1982. Application for reissue Dec. 23, 1986, Ser. No. 4,172

Int. Cl.[4] A61K *39/395, 39/42;* G01N *33/54, 33/56*

U.S. Cl. 424—86 12 Claims

1. The method of immunizing a host mammal against an infectious organism having a site which binds specifically to a receptor site on a host cell which method comprises

providing a first monoclonal antibody which binds specifically to said organism site,

providing a second monoclonal antibody which binds specifically to the first, and

inoculating said mammal with an effective amount of said second antibody to [bind specifically to said receptor site and block binding of said organism thereto.] *immunize said mammal.*

Re. 32,834

AQUEOUS LIQUID FILLED POLYURETHANE GELS AND METHOD OF MAKING THE SAME

Howard P. Cordts, Grafton, and Joan E. Karloske, Saukville, both of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Original No. 4,517,326, dated May 14, 1985, Ser. No. 487,507, Apr. 22, 1983. Continuation-in-part of Ser. No. 273,499, Jun. 15, 1981, abandoned. Application for reissue May 11, 1987, Ser. No. 48,726

Int. Cl.[4] C08L *75/08*

U.S. Cl. 524—310 38 Claims

1. A method for producing a thermoset article having a polyurethane elastomer continuous phase and having dispersed liquid-phase droplets as a discontinuous phase, comprising:

A. obtaining polyisocyanate prepolymer having an NCO—value of 2.5–3.0, formed from the reaction of organic di-isocyanate and organic polyether polyol, containing at least 40 percent by weight ethylene oxide adducts;

B. mixing said polyisocyanate prepolymer under reactive conditions with an aqueous reactant including 25 to 65 percent by weight water and 75 to 35 percent by weight of organic polyol, the weight of said aqueous reactant being from 3 to 20 times the weight of said polyisocyanate prepolymer;

C. after gelation of the mixture has commenced but before gelation has completed, forming the mixture into a desired shape until the mixture cures with discrete droplets of unreacted aqueous reactant homogeneously dispersed therethrough; and

D. recovering a homogeneous shaped article containing from 75 to 95 percent by weight of the said aqueous reactant.

Re. 32,835

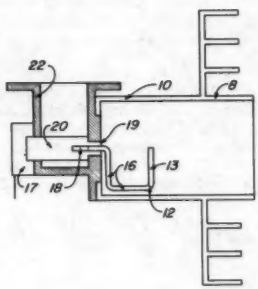
POLARIZED SIGNAL RECEIVER SYSTEM

H. Taylor Howard, San Andreas, Calif., assignor to Chaparral Communications, Inc., San Jose, Calif.

Original No. 4,414,516, dated Nov. 8, 1983, Ser. No. 322,446, Nov. 18, 1981. Application for reissue Nov. 6, 1985, Ser. No. 795,426

Int. Cl.[4] H01P *1/165*

U.S. Cl. 333—21 A 23 Claims



16. A polarized signal receiver comprising:

first and second waveguides adapted to enable propagation therein along their respective longitudinal axes of signals comprised of polarized electric fields within a predetermined range of frequencies;

a launch probe in said first waveguide and a receiver probe in said second waveguide, each said probe oriented substantially normal to the direction of propagation of the signal comprised of the electric field in the respective waveguide; and

a conductive element interconnecting said probes and entering said second waveguide in one direction through a point of

entry surrounded by a first interior wall surface, said first interior wall surface facing in said one direction, said conductive element having a first portion displaced laterally from said point of entry to overlie said first interior wall surface and extending toward a second interior wall surface to a point closer to said second interior wall surface than to said point of entry, said conducting element having a second portion overlying said second interior wall surface, said second interior wall surface facing inwardly of said second waveguide in a direction different than said one direction, said conductive element cooperating with each of said interior wall surfaces as the ground plane therefor such that said conductive element and said interior wall surfaces constitute a single wire above a ground plane transmission line within said second waveguide for said predetermined range of frequencies.

Re. 32,836
Patent Not Issued For This Number

Re. 32,837

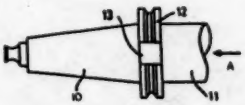
CODING SYSTEMS FOR ELEMENTS OF MACHINE TOOLS, PARTICULARLY OF THE NUMERICALLY CONTROLLED TYPE

Vittorio Corni, Modena, Italy, assignor to Comau S.p.A., Grugliasco, Italy

Original No. 4,533,823, dated Aug. 6, 1985, Ser. No. 457,277, Jan. 11, 1983. Application for reissue Aug. 3, 1987, Ser. No. 82,093

Int. Cl.[4] **G06F** *15/20*

U.S. Cl. 235—375 **15 Claims**



1. A storage system for elements of machine tools[, particularly] of the numerically controlled type, comprising *a plurality of different machine tool elements,* means **(15)** for storing [a] *said* plurality of different [said] elements, *a plurality of different "bar" codes comprised of* a different "bar" code **(14)** carried by each different element, a reading head **(17)** for reading the different codes, and a code detection sensor **(18)** adapted to be juxtaposed successively with the various different elements to sense the code on the elements and to transmit to the reading head signals representative of the identity of the said element with which said sensor is juxtaposed.

PLANT PATENTS

GRANTED JANUARY 17, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,533
AFRICAN VIOLET PLANT NAMED LIBRA

Reinhold Holtkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 56,413
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Libra, as described and illustrated, and particularly characterized by its single solid purple flowers; upright flower stems curving toward the center; profuse flowering; vigorous growth habit; very attractive girl-type leaves, round, slightly serrated with a small light green center; and long lasting and non-dropping flowering habit.

6,534
AFRICAN VIOLET PLANT NAMED CORINNA

Reinhold Holtkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 56,414
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Corinna, as described and illustrated, and particularly characterized by its star-shaped, very large light pink flowers with wavy edges; strong upright flower stems, producing a nice bouquet; profuse flowering; vigorous growth habit; medium green oval leaves; and long lasting and non-dropping flowering habit.

6,535
AFRICAN VIOLET PLANT NAMED LOS ANGELES

Reinhold Koltkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 56,415
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Los Angeles, as described and illustrated, and particularly characterized by its deep blue, semi-double flowers; tight bouquet of flowers on strong peduncles standing free above medium green, strongly girl-type leaves with bright light green centers; vigorous growth habit; and long lasting and non-dropping flowering habit.

6,536
AFRICAN VIOLET PLANT NAMED CAROLYN

Reinhold Holtkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 56,473
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Carolyn, as described and illustrated, and particularly characterized by its bright, relatively dark pink, violet-shaped single flowers; tight bouquet above the leaves on strong upright flower stems; profuse flowering; vigorous growth habit; dark green, sometimes serrated, velvety leaves; and long lasting and non-dropping flowering habit.

6,537
KENTUCKY BLUEGRASS 'BA 72-492'

Virgil D. Meier, and Eugene W. Mayer, both of Marysville, Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio

Filed Mar. 17, 1987, Ser. No. 27,285
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 1 Claim

1. A variety of Kentucky bluegrass plant, substantially as shown and described, characterized particularly by a high level of resistance to diseases, a desirable green color throughout the growing season, a high quality persistent turf under a wide range of environmental conditions including shady conditions and a medium level of seed yielding capacity.

6,538
KENTUCKY BLUEGRASS—BA 70-139

Virgil D. Meier, and Eugene W. Mayer, both of Marysville, Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio

Filed Mar. 17, 1987, Ser. No. 28,424
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 1 Claim

1. A variety of Kentucky bluegrass plant, substantially as shown and described, characterized particularly by a high level of resistance to diseases, a desirable green color throughout the growing season, a high quality persistent turf under a wide range of environmental conditions including shady conditions, and a high level of seed yielding capacity.

6,539
PYRAMIDAL ENGLISH OAK NAMED ASJES *QUERCUS ROBUR*

Evert Asjes, Jr., 11601 Blue River Rd., Kansas City, Mo. 64131

Filed Dec. 11, 1986, Ser. No. 940,417
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of *Quercus robur* var. fastigiata and the parts thereof, substantially as herein shown and described, and being particularly distinguished by its fast growing, densely clothed fastigiate form and its very strong resistance to mildew.

6,540
PEACH TREE 'CHIYOHIMI'

Teruo Nishida, Tokyo; Masao Yoshida, Ibaraki; Hidetoshi Kyotani, Tokyo; Masami Yamaguchi, and Teruo Kozono, both of Ibaraki, all of Japan, assignors to Fruit Tree Research Station, Ministry of Agriculture, Forestry and Fisheries, Tsukuba, Japan

Filed Mar. 13, 1987, Ser. No. 25,707
Claims priority, application Japan, Mar. 31, 1986, 61-1893
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—42 1 Claim

1. A new and distinct variety of peach tree, substantially as illustrated and described herein, characterized over known peach trees by (A) having a moderate vigor, (B) being self-fertile with abundant pollen, (C) having a good bearing character and being productive with a low physiological fruit drop, (D) having pink, showy and large flowers, and (E) producing a clingstone fruit (a) having a good keeping quality, a round elliptic shape and sturdy and attractive skin having a white ground color with a bright red blush, (b) maturing early in the season, a few days later than 'Saotome' and a few days earlier than 'Nunomewase', and (c) having a melting flesh having a white color with some red pigment, which has a moderate

firmness, is fine and juicy, has a moderate sweetness and a low acidity, and has a good taste for dessert.

6,541

NECTARINE TREE, SUMMER LION—TREE

Donald M. Serimian, 2961 McCall Ave., and Lionel M. Serimian, 11310 E. Manning, both of Selma, Calif. 93662

Filed Nov. 13, 1987, Ser. No. 120,495
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree to be denominated varietally as "Summer Lion—Three" substantially as illustrated and described and which is characterized principally as to novelty by its production of dark red fruit which are ripe for commercial harvesting approximately July 25 through August 5 in Selma, Calif., the fruit of the subject variety being further characterized as to novelty by having a large size, a superior shape, and being freestone by nature.

6,542

NECTARINE TREE, "MAY LION"

Donald M. Serimian, 2961 McCall Ave., and Lionel M. Serimian, 11310 E. Manning, both of Selma, Calif. 93662

Filed Nov. 13, 1987, Ser. No. 120,497
Int. Cl.[4] A01H 5/03
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of Nectarine Tree substantially as illustrated and described which is remotely similar to the Armking Nectarine Tree (U.S. Plant Pat. No. 2,943) and the Summer Grand Nectarine Tree (U.S. Plant Pat. No. 2,879) from which it was derived as a cross pollinated offspring but from which it is distinguished therefrom and characterized as to novelty by producing fruit which are mature for commercial harvesting approximately May 18 through May 25 in Fresno County, Calif. and which additionally produces a large early season fruit having a dark red skin color and a superior globose shape, and which further has a flesh color which is a uniform clear yellow from the skin to the pit, the fruit of the subject variety having no red coloration in the flesh at commercial maturity.

6,543

NECTARINE TREE, "SUMMER LION"

Donald M. Serimian, 2961 McCall Ave., and Lionel M. Serimian, 11310 E. Manning, both of, Selma, Calif. 93662

Filed Nov. 13, 1987, Ser. No. 120,498
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree substantially as illustrated and described which is somewhat similar to the May Grand Nectarine Tree (U.S. Plant Pat. No. 2,794), and the Red Lion Nectarine Tree (U.S. Plant Pat. No. 5,591) from which it was derived as a cross pollinated seedling but from which it is distinguished therefrom and characterized as to novelty by producing fruit which are mature for commercial harvesting approximately July 1 through July 12 in the San Joaquin Valley of central California and which additionally produces fruit which have a very large size, a clingstone nature, a dark red skin color and a flesh color which is amber-yellow; the fruit of the subject variety having noteworthy eating qualities.

6,544

NECTARINE TREE, "SUMMER LION — TWO"

Donald M. Serimian, 2961 McCall Ave., and Lionel M. Serimian, 11310 E. Manning, both of Selma, Calif. 93662

Filed Nov. 13, 1987, Ser. No. 120,499
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree substantially as illustrated and described which is somewhat similar to the May Grand Nectarine Tree (U.S. Plant Pat. No. 2,794), and the Red Lion Nectarine Tree (U.S. Plant Pat. No. 5,591) from which it was derived as a cross pollinated seedling but from which it is distinguished therefrom and characterized as to novelty by producing fruit which are mature for commercial harvesting approximately July 10 through July 19 in the San Joaquin Valley of central California and which additionally produces a very large globose shaped fruit which has a freestone nature, a dark burgundy red to a lighter cherry red skin color and a flesh color which is clear amber-yellow; the fruit of the subject variety having excellent eating qualities.

6,545

CHRYSANTHEMUM NAMED "REPIN"

Martinus van der Jagt, Ter Aar, Netherlands, assignor to Chrysantheum Breeders Association NV, Netherlands Antilles

Filed Sep. 30, 1986, Ser. No. 782,101
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim

1. A new and distinctive variety of Chrysanthemum named Repin as described and illustrated in the foregoing specification and accompanying drawings.

6,546

MINIATURE ROSE PLANT/MINAFCO

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed Apr. 29, 1987, Ser. No. 43,809
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of exhibition form, essentially orange in color, the petals on outside surface being darker orange than the orange on inside surface, and further characterized by a plant of compact well rounded shape; vigorous, with the main stems and shoots being of average thorniness, the said plant being easy to propagate from cuttings or by budding, with an abundance of small semi-glossy to matt foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

6,547

MINIATURE ROSE PLANT/MINAICO

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed Apr. 29, 1987, Ser. No. 43,816
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, climbing, bushy, upright, branched habit, substantially as illustrated and described, characterized by buds and flowers of exhibition form, essentially deep medium red in color, and further characterized by a plant of compact upright shape; vigorous, with the main stems and shoots being of average thorniness, the said plant being easy to propagate from cuttings or by budding, with an abundance of small semi-glossy to mat foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

6,548

HYBRID MINIATURE ROSE PLANT CV. MORPAPPLAY

Ralph S. Moore, Visalia, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed May 11, 1987, Ser. No. 48,446
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—2 1 Claim

1. A new and distinct variety of climbing miniature rose plant cv. morPapplay and the parts thereof, of hardy, compact, prostrate and trailing, much-branched habit; being particularly characterized by its abundance of flowers, usually borne in clusters of 5 to 10 or more; its buds and flowers of pleasing form, the petals being a blend of red and yellow shades, essentially red on their top surface and yellow on the lower surface; its vigorous growth; its moderately thorny shoots and main stems; its abundance of small, semi-glossy to matt foliage; and its ease of propagation by cuttings or budding, substantially as described and illustrated herein.

PATENTS

GRANTED JAN. 17, 1989

ERRATA

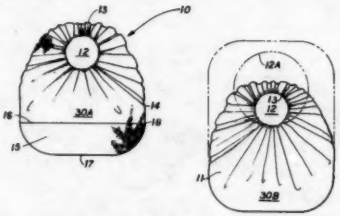
For CLASS	See PATENT NO.
081-126	4,797,965
232-043	4,798,316
235-487	4,798,322
239-663	4,798,325
118-408	4,798,474
384-108	4,798,476
434-323	4,798,543
494-018	4,798,579
493-338	4,798,581
437-041	4,798,794
514-159	4,798,811
502-060	4,798,813
501-089	4,798,814
428-373	4,798,815
546-015	4,798,821
524-089	4,798,836
525-007	4,798,859
558-186	4,798,872
556-401	4,798,889
568-614	4,798,906
318-045	4,798,999
341-101	4,799,040
341-120	4,799,041
341-118	4,799,042
341-005	4,799,044
235-467	4,799,164

PATENTS

GRANTED JANUARY 17, 1989

GENERAL AND MECHANICAL

4,797,952
THROWAWAY BIB
Grace Petrini, 4299 W. Carlin Rd., Stockton, Calif. 95206
Filed Sep. 15, 1987, Ser. No. 96,443
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R **7 Claims**



1. A disposable or few times rinsible protective bib comprising:

a substantially rectangular main panel having an upper transverse edge and a lower transverse edge, and being of two-ply construction, an outer sheet and an inner sheet the two sheets of said panel being coextensive, of flexible material, having a neck opening at the upper end thereof, said neck opening surrounded by a gathered portion to ensure a close fit to the wearer's neck;

and an optional pocket section having a transverse opening at the top thereof, extending up from the lower transverse edge of the main panel;

the front sheet being made of a few times rinsible water absorbent material, while the rear sheet is a non-permeable plastic film.

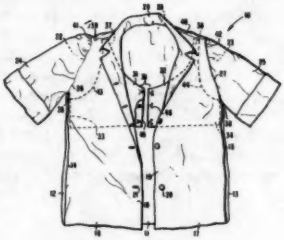
4,797,953
NURSING SHAWL
Rodger S. Dameron, 2408 Maxwell, Midland, Tex. 79705
Filed Jul. 27, 1987, Ser. No. 78,411
Int. Cl.[4] A41D *1/20*
U.S. Cl. 2—104 **9 Claims**

1. A nursing shawl of unitary design that can be worn by a mother nursing an infant, said shawl is symmetrical about a centerline, said shawl comprising a left panel spaced from a right panel, and a neck band, said right panel and said left panel are of general rectangular configuration and are joined together by said neck band at the upper center of the shawl;

the right and left panels have outer opposed edges, inner confronting edges, and upper edges spaced from lower edges; said neck band being a segment of an annulus having a circumference determined by spaced sides; the upper adjacent corners of said panels are cut obliquely and attached to said spaced sides of the neck band; said neck band is defined by concentric circles having oblique sides joined to the upper adjacent corners of said left and right panels; whereby:

said neck band is received across the back of a nursing mother, with the right panel extending from the right shoulder down over the right breast; and, with the left panel extending from the left shoulder down over the left breast with the panels jointly covering the entire front of the mother from the neck to the waist, and from one side to the other while the outer opposed edges hang down by the sides of the mother in a draped manner.

4,797,954
SHIRT WITH SECURITY CLOTH
Ruth L. Williams, 289 NE. 8th St., Linton, Ind. 47441, and Thelma M. Orman, 913 Lankford St., Clay City, Ind. 47841
Filed Oct. 5, 1987, Ser. No. 104,650
Int. Cl.[4] A41D *1/22*
U.S. Cl. 2—106 **9 Claims**

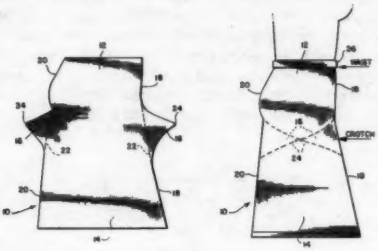


1. A shirt comprising:

a shirt main body configured to fit around a wearer's upper torso and having a front chest portion and a back portion joined together to completely encircle the wearer, said shirt main body including a pair of front panels and a pair of separable front edges, and further including first fastening means extending down said front chest portion on said separable front edges operable to allow the front edges to be separated when the shirt is being put on and taken off the wearer and to be closed together once the shirt is on the wearer, said shirt main body having two attachment areas separated by a first distance on said front panels when said front edges are closed together; and,

a security cloth enclosed within said main body and extending only partially around the wearer, said cloth having opposite ends fastened to said two attachment areas, said security cloth located inwardly of and extending only adjacent and across said front chest portion, immediately adjacent said fastening means and internally across said front edges to prevent the shirt main body from separating when the shirt is on the wearer located between and separating said security cloth and said back portion apart, said security cloth has a length between said opposite ends shorter than said first distance terminating forward of said back portion with the wearer's chest protruding forward against said security cloth pulling said back portion forwardly toward the wearer's back and isolating said front panels and fastening means from stress.

4,797,955
COMBINATION PANT AND SKIRT GARMENT
Alfred G. Garrett, Box 5956, Hilton Head, S.C. 29938
Filed Jul. 22, 1987, Ser. No. 76,344
Int. Cl.[4] A41D *1/14*
U.S. Cl. 2—213 **10 Claims**



1. A garment comprising:

a first portion extending upward from the crotch comprising a crotch section which passes between the legs of the wearer when the garment is worn; and

a second portion connected to said first portion and adapted to encircle the legs of the wearer when the garment is worn, whereby said first and second portions are adapted to serve as the outermost material of the garment, so that the garment has a pant-like appearance above the crotch and a skirt-like appearance below the crotch,

said first and second portions being formed from two side panels attached together along a front seam line and a rear seam line, each said side panel having two protrusions extending, respectively, from the front and back of the garment toward each other, said protrusions being attached to each other to form the crotch section of said garment.

4,797,956
EYE SHIELD
Elvin L. Boyce, Salt Lake City, Utah, assignor to Professional Tape Converters, Inc., Salt Lake City, Utah
Filed Oct. 15, 1987, Ser. No. 108,925
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—431 **18 Claims**

6. An eye shield for protecting a wearer's eyes against contamination from fluids or injury from objects, comprising:

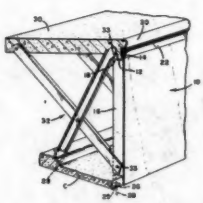
an essentially flat, flexible transparent medium having an inner surface to be worn near the wearer's eyes, an outer surface, a bottom portion, and a top portion;

means for spacing the transparent medium away from the wearer's face such that the inner surface does not touch the wearer's eyes, said means for spacing being attached to said top portion;

first moldable stiffening means for conforming said transparent medium to the wearer's nose and cheeks and attached to said transparent medium along said bottom portion, said first moldable stiffening means being laterally disposed and bendable across the wearer's nose and cheeks when the eye shield is installed upon the wearer's face so as to transform the transparent medium from an essentially flat configuration to one which conforms to the contour of the wearer's nose and cheeks; and

single band means for securing said eye shield to the wearer's head.

4,797,957
SWIMMING POOL WITH IMPROVED WALL STRENGTHENING MEANS
Donald H. Weir, York, and Charles F. Robinson, Felton, both of Pa., assignors to Fox Pool Corporation, York, Pa.
Continuation-in-part of Ser. No. 349,501, Feb. 17, 1982, abandoned. This application Mar. 22, 1984, Ser. No. 592,309
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—506 **8 Claims**



1. A below-ground swimming pool comprising an assemblage of metal side wall panels having vertical reinforcing posts welded at intermittent locations along the length of the panel side, said panels being joined in end-to-end relationship and being braced in upright position to form the perimeter of the swimming pool, a cut-out at the top of said posts for receiving in said cut-out a stiffening member horizontally positioned within said cut-out so that the top of said stiffening member is inset within said cut-out and is not higher than the top of said wall panel and not higher than the top of the post and is positioned in said cut-out such that the stiffening member abuts against the back of the said wall panel at the upper edge of the wall panel, bracing members secured on vertical posts at points contiguous to the top and to the bottom of said vertical posts and extending outward from said wall panels and secured in a footing and a poured concrete deck formed around the outer

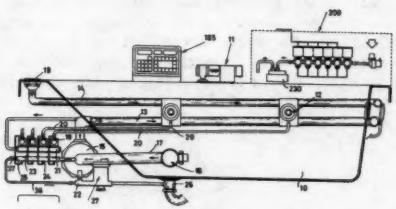
periphery of the pool and embedding therein the top of said bracing members, the top of the vertical posts containing said cut-out, the top of said wall panels and said stiffening member.

4,797,958

BATHTUB WITH IMPROVED HYDROMASSAGE SYSTEM

Virgilio Guzzini, Recanati, Italy, assignor to Teuco Guzzini S.r.l., Recanati, Italy

Filed Sep. 5, 1986, Ser. No. 904,004
Claims priority, application Italy, Sep. 17, 1985, 22165 A/85
Int. Cl.[4] A61H *33/02, 9/00*
U.S. Cl. 4—542 **19 Claims**



1. A bathtub equipped with a water supply tap (11) and with a hydromassage system comprising a plurality of nozzles (12) mounted on the walls of the bathtub (10), water and air supply lines each connected to each of said nozzles, a pump (15) having an outlet connected to said water supply line and an inlet, a normally closed suction valve (16) connected to the interior of said bathtub, a suction line (17) connecting said suction valve (16) to the inlet of said pump, each of said nozzles comprise a water jet orifice connected to said water supply line and an annular air inlet orifice connected to said air supply line, said water jet orifice and said air inlet orifice being concentrically arranged such that the water jet entrains air through said annular air inlet to form an air-water mixture, each of said nozzles further having a movable plug mounted in said jet orifice to close both said water jet orifice and said annular air inlet and means for biasing said plug to said closed position so as to separate in a sealed manner the water and air supply lines to the interior of the bathtub, conduit means adjustably mounted with respect to said jet nozzle for regulating the flow of the air-water mixture to the interior of the bathtub, said nozzles including actuator means responsive to water pressure in said water supply line for moving said plug to an open position, an automatic outlet drain connected to the floor of said bathtub, said outlet drain having a normally open outlet valve therein, sensor means (27) responsive to predetermined levels of water in said bathtub and to water pressure in said water supply line for closing said outlet valve and controlling the operation of said tap (11) and pump (15) within predetermined safety ranges.

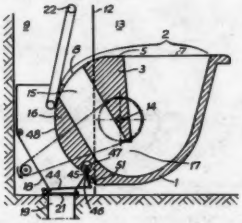
4,797,959

SANITARY UNIT

Jean-Claude Decaux, 88, boulevard Maurice Barres, 92200 Neuilly, France

Filed Apr. 13, 1987, Ser. No. 37,558
Claims priority, application France, Apr. 17, 1986, 8605524
Int. Cl.[4] E03D *9/00*; A47K *17/00*
U.S. Cl. 4—662 **13 Claims**

1. A sanitary unit comprising an enclosure, partition means for separating said enclosure into a front usage zone accessible to a user and a normally inaccessible rear maintenance zone, a bowl juxtaposed with said partition means and mounted for pivoting between a utilization position in which said bowl projects generally horizontally from said partition means into said usage zone and a cleansing position in which said bowl is pivoted rearwardly at least partially past said partition means, cleansing means disposed in said maintenance zone for cleaning said bowl in said cleansing position, and drive means for pivoting said bowl between said utilization and cleansing positions, said bowl having a closed base, an outer wall defining an opening which is above said base in said utilization position of said bowl and a separating wall extending generally vertically when said bowl is in said utilization position and dividing said opening into a front utilization section and a rear evacuation section, the upper face of said separating wall cooperating with



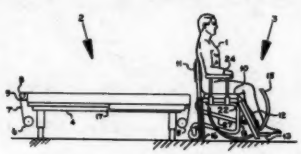
said outer wall to define a rim surrounding said utilization section of said opening, and said separating wall cooperating with a rear part of said outer wall and with said base to define a passage between said utilization section and said evacuation section of said opening, said evacuation section being higher than said passage in said utilization position, whereby to contain the contents of the bowl, and being lower than said passage in said cleansing position, whereby to empty the contents of the bowl into said maintenance zone.

4,797,960

PATIENT TRANSFER ARRANGEMENT

Joseph G. Vaiana, Levittown; Paul Di Matteo, Dix Hills; Charles F. Chubb, Brookville, all of N.Y., assignors to Nova Technologies Inc., Hauppauge, N.Y.

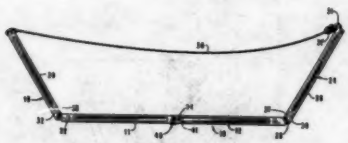
Continuation-in-part of Ser. No. 731,533, May 7, 1985. This application Feb. 12, 1987, Ser. No. 13,687
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] A61G *7/08*
U.S. Cl. 5—81 R **20 Claims**



1. An invalid transfer arrangement comprising: a wheelchair removably positioned at the end of a bed; said wheelchair having wheels, a frame, a back rest and a seat; and a leg rest all movably attached to said frame; said back rest being removable from behind a person's back seated in the wheelchair; said leg rest being raisable from an inclined to a substantially level position; said bed having a mattress adjacent to and approximately the same height as said level position; a transport sheet extending across the mattress; roller means for moving said transport sheet and transporting a reclining person at a velocity across the mattress and onto said leg rest and seat of the wheelchair; motion means for moving at substantially said velocity a top surface on said leg rest and seat to transport the reclining person so that the persons' buttocks are placed over said seat; lift means for raising said reclining person to a sitting

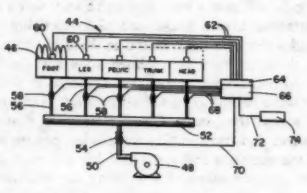
position on the seat; and means for inserting said back rest behind the person.

4,797,961
PORTABLE HAMMOCK SUPPORT
Mark A. Pasquariello, 1405 Thames Dr., Lexington, Ky. 40502
Filed Sep. 23, 1987, Ser. No. 100,272
Int. Cl.[4] A45F *1/00*
U.S. Cl. 5—127 **20 Claims**



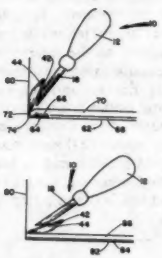
1. A portable hammock support including:
first ground support means for engaging the ground;
second ground support means for engaging the ground, said first ground support means and said second ground support means being spaced from each other;
first hammock support means pivotally connected to said first ground support means and said second ground support means for movement between a collapsed position in which said first hammock support means is disposed in the same plane as said first ground support means and said second ground support means and a raised operative position in which said first hammock support means is disposed at an angle to said first ground support means and said second ground support means;
second hammock support means pivotally connected to said first ground support means and said second ground support means for movement between a collapsed position in which said second hammock support means is disposed in the same plane as said first ground support means, said second ground support means, and said first hammock support means when said first hammock support means is in its collapsed position and a raised operative position in which said second hammock support means is disposed at an angle to said first ground support means and said second ground support means;
and a hammock extending between said first hammock support means and said second hammock support means when said first hammock support means said second hammock support means are in their raised operative positions.

4,797,962
CLOSED LOOP FEEDBACK AIR SUPPLY FOR AIR SUPPORT BEDS
Barry L. Goode, Humble, Tex., assignor to Air Plus, Inc., Harris Co., Tex.
Filed Nov. 5, 1986, Ser. No. 927,498
Int. Cl.[4] A47C *27/08*; F04B *49/00*
U.S. Cl. 5—453 **13 Claims**



1. In a low air loss air support convalescent bed having a plurality of low air loss air sacs that are maintained within a desired pressure range and are arranged for supporting various body sections of a patient, the improvement comprising:
(a) air supply means for supplying compressed air at a pressure in excess of said desired pressure range of any of said air sacs;
(b) air distributing means for distributing compressed air from said air supply means to said plurality of air sacs;
(c) pressure control means having a plurality of servo valves for conducting air at preset pressure ranges to individual air sacs;
(d) pressure monitoring means continuously monitoring the air pressure of each of said air sacs and providing pressure indicative signals; and
(e) feedback means receiving said pressure indicative signals and providing pressure signals to said pressure control means for each of said air sacs, said pressure control means adjusting said servo valves appropriately to maintain the proper pressure range in each of said air sacs, whereby the selected interface pressure between the air sacs and the patient is established.

4,797,963
CARPET FINISHING TOOL
Roy Gulino, 505 E. County Line Rd., Lakewood, N.J. 08701
Filed Apr. 15, 1988, Ser. No. 182,096
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—103 **6 Claims**



1. A carpet finishing tool comprising
a handle having a first end and a second end, said first end having a contoured gripping surface, said second end having longitudinally secured thereto a support shaft having a first end secured to said handle and a second end, said second end having a planer surface acutely angled with the axis of said support shaft;
a rotatable disk having a base and a top, truncated in cross sectional area defining a tapered surface from said base to said top, said base having rounded edges;
said rotatable disk mounted on said support shaft such that said base is parallel with said planer acutely angled surface of said support shaft.

4,797,964

COMPOSITIONS FOR FINISHING TEXTILES

Wolfgang Ritter, Hilden; Hans-Peter Handwerk, Duesseldorf; Kaspar Schlueter, Solingen, and Heinz Hassenjuergen, Korschenbroich, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 22, 1987, Ser. No. 65,232

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620679

Int. Cl.[4] D06M *15/00*

U.S. Cl. 8—115.6 13 Claims

1. In a method of treating textiles with an aqueous emulsion polymer, the improvement wherein the textile is treated with an aqueous emulsion comprising:

(a) from about 40 to about 60% by weight of either a polymer of vinyl acetate, a copolymer of vinyl acetate and dibutyl maleate, or a mixture of the foregoing; and

(b) from about 2 to about 10% by weight of a polyethylene glycol having a molecular weight of from about 3,000 to about 50,000;

wherein the above percentages by weight are based on the weight of the aqueous emulsion, and wherein the aqueous emulsion is employed in a quantity sufficient to impart a soft and full feel to the textile.

4,797,965

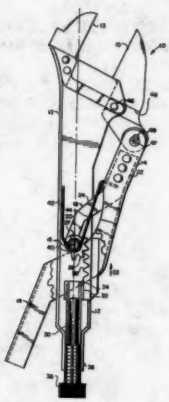
WRENCH WITH RACK AND SEGMENT GEAR LINKAGE

Thomas J. Mazzone, 4016 Audubon Dr., Largo, Fla. 33541

Filed Apr. 21, 1988, Ser. No. 184,270

Int. Cl.[4] B25B *13/12*

U.S. Cl. 81—126 24 Claims



1. A wrench having pivotally connected handle members, comprising:

a first handle member having a fixed position jaw means formed on its proximal end;

a second handle member having a movable jaw means formed on its proximal end;

a pivot point where said handle members are pivotally connected to one another;

a rigid pivot arm extending from said second handle member;

a segment gear member integrally formed with said pivot arm;

a rack gear member that is slideably mounted with respect to said first handle member;

said rack gear member having a distal position and a proximal position and a plurality of positions therebetween;

said rack gear member being meshingly engaged with said segment gear member, said segment gear member being constrained to rotate when said rack gear member travels between its distal and proximal positions;

a bias means having a power sufficient to cause said jaw members to separate from one another, which movement effects sliding travel of said rack gear member in a proximal-to-distal direction;

said segment gear having an axis of rotation coincident with said pivot point so that pivoting of said second handle member under the influence of said bias means effects simultaneous and corresponding rotation of said segment gear;

and means for overcoming the bias provided by said bias means so that when said jaw members are closed, the power of said bias means is inadequate to separate them.

4,797,966

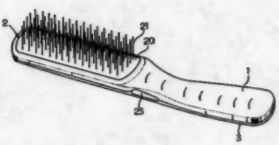
ANTI-ELECTROSTATIC BRUSH

James C. Fong, Taipei, Taiwan, assignor to Tong-Fong Brush Factory Co., Ltd., Taiwan

Filed Jun. 19, 1987, Ser. No. 63,890

Int. Cl.[4] A46B *9/08*

U.S. Cl. 15—186 15 Claims



1. An anti-electrostatic brush comprising:

an electrically conductive bristle receiving means receiving a plurality of bristles thereon, said bristle receiving means being provided with a contact part;

a first housing part having a first opening at one end thereof and a first handle portion at the other end thereof, said first opening being slightly smaller than said bristle receiving means, said first housing part being provided with a first engagement means; and

a second housing part having a means for receiving said bristle receiving means at one end thereof and a second handle portion at the other end thereof, said second housing part being provided with a second engagement means to be engaged with said first engagement means securing the first and second housing parts together, wherein at least one of first and second housing parts has a second opening at the handle portion thereof, through which second opening said contact part of said bristle receiving means is exposed to the surface of said handle portion.

4,797,967

PADDED GENERAL PURPOSE MITTEN AND METHOD OF FABRICATING SAME

Hans L. Lengers, Charlotte, N.C., assignor to U.S. Textiles Corporation, Charlotte, N.C.

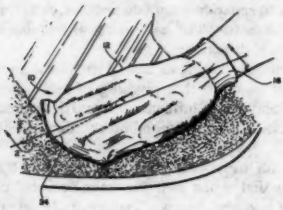
Filed Oct. 5, 1987, Ser. No. 105,406

Int. Cl.[4] A47L *13/18*

U.S. Cl. 15—227 15 Claims

1. A method of fabricating a padded mitten useful for polishing, cleaning and like uses, comprising the steps of providing a tubular length of fabric having one longitudinal end thereof closed, inserting padding means in a first lengthwise end portion of said fabric at its closed end, transversely closing said fabric at a medial location defining said first lengthwise end portion and enclosing said padding means therein, and everting the remaining lengthwise portion of said fabric over its first

lengthwise portion to form interior hand pockets therebetween at opposite sides of said first lengthwise portion for selective



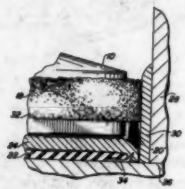
insertion of a user's hand at opposite sides of said padding means.

4,797,968

VACUUM CLEANER HEAD PROTECTOR AND DUSTER

Judy I. Wenzlick, 1516 W. St. John Rd., Phoenix, Ariz. 85023, and Judith E. Wenzlick, 6751 W. Topeka, Glendale, Ariz. 85308

Filed May 11, 1988, Ser. No. 192,602
Int. Cl.[4] A47L *9/00*
U.S. Cl. 15—246 **17 Claims**



1. A protective apparatus for use on the head of a vacuum cleaner, carpet sweeper, and the like, said head having a periphery including at least a front and first and second sides, said apparatus comprising:

a strip of fabric having upper and lower edges and first and second major surfaces, said strip having a length sufficient to extend along said periphery;

first means for detachably securing said strip of fabric to said periphery of said head; and

at least one brush removably coupled to said strip of fabric at a location which is adjacent at least one of said first and second sides when said strip is secured to said periphery.

4,797,969

BUILDING EXTERIOR CLEANING APPARATUS

Edward A. Caduff, 258 W. Deer Park Rd., Gaithersburg, Md. 20877

Filed Jan. 9, 1987, Ser. No. 1,763
Int. Cl.[4] A47L *1/04*
U.S. Cl. 15—302 **19 Claims**

1. A vertical building exterior cleaning apparatus comprising:

a housing;

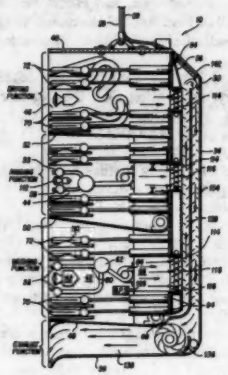
a washing chamber disposed in said housing, said washing chamber having means for impinging a cleaning fluid on the building exterior;

a rinsing chamber disposed in said housing, said rinsing chamber having means for impinging a rinsing fluid on the building exterior;

means for maintaining a negative pressure in the interior of said washing and rinsing chambers; and

means for regulating the negative pressure in said washing chamber and said rinsing chamber;

wherein said washing and said rinsing chambers have openings defined therein and said means for regulating the negative pressure in said washing chamber and said rinsing chamber comprises a plurality of vanes axially rotatably mounted in said openings for varying the size of said openings.

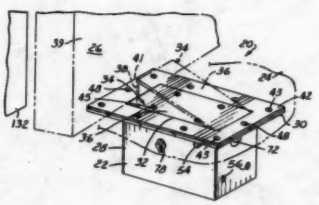


4,797,970

FOOT-OPERATED DOOR SECURITY DEVICE

John C. Charlton, 581 Middleside Road, Rte. 3,, Amherstburg, Ontario, Canada N9V 3R3

Filed Feb. 22, 1988, Ser. No. 158,561
Int. Cl.[4] E05F *5/00*
U.S. Cl. 16—82 **14 Claims**



1. A door stop comprising:

a stop member having a door-engaging surface and a camming surface;

a housing having an opening to closely receive said stop member;

a latching mechanism having a barrel and a spring-biased plunger within said barrel;

said latching mechanism further including a catch for retaining said plunger in a retracted position within said barrel;

said plunger having an end for engaging said camming surface of said stop member;

means for biasing said stop member in a first position in which at least a portion of said stop member projects out of said housing through said opening; and

means responsive to pressure exerted on said stop member for pivoting said stop member between said first position and a second position, said stop member being substantially within said housing in said second position.

4,797,971

ADJUSTING DEVICE FOR A VEHICLE DOOR

Georg Eger, Hochdorf, and Rainer Srock, Leonberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

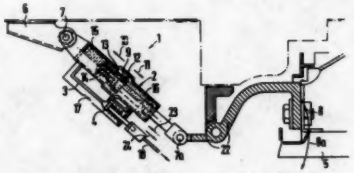
Filed Jan. 27, 1987, Ser. No. 7,361

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602405

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] E05F 5/02, 3/12

U.S. Cl. 16—82 9 Claims



1. A control mechanism for a motor vehicle door that is actuated via an inside and outside handle and comprises a piston-cylinder unit arranged between a door post and the vehicle door, said piston-cylinder unit having a piston equipped with passage openings for a pressure medium, said piston interacting with an interior valve separating two working chambers of the cylinder with respect to one another, and the control mechanism being equipped with a blocking valve controlling the flow of medium, said blocking valve being arranged in a control circuit connecting the two working chambers of the cylinder so that said blocking valve acts against the flow direction and is controllable via control means at a door handle in such a way that the door is blocked in at least one intermediate position, wherein:

the cylinder has at least one overflow duct between the two working chambers, the flow-through of which is controlled by the piston of the unit, and in that the duct extends over a range into which the piston immerses during the initial opening of the door from the closed position and opens the duct between the working chambers.

4,797,972

SHEET METAL INSERT CUP FOR CABINET HINGES HAVING A MORTISE CENTERING MECHANISM

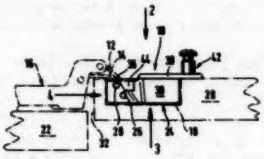
Karl Lautenschlager, Jr., Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Jun. 7, 1984, Ser. No. 618,131

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327673

Int. Cl.[4] E05D 5/02

U.S. Cl. 16—382 4 Claims



1. An insert cup to be fastened in a substantially cylindrical mortise provided close to an edge in the inside face of a door-leaf of a cabinet, and serving as a door-leaf related part of a cabinet hinge; said insert cup being a stamped and drawn piece of sheet metal having an elongated trough-like part for insertion into the mortise, a marginal flange at an upper edge of the trough-like part, said marginal flange having a sector-shaped flange section to fit matingly and flush within the mortise adjacent the edge, and also having a fastening flange section to lie on said inside face remote from said edge, and at least two guiding lugs integral with said sector-shaped flange section and respectively symmetrically on opposite sides of the longitudinal central plane of the elongated trough-like part, said lugs being bent downwardly from said upper edge at right angles to extend into the interior of the mortise so as to rest against a circumferential wall of the cylindrical mortise and center the insert cup in the mortise and securing the cup against displacements in the plane of the door-leaf.

4,797,973

BAGGING AND APPORTIONING MACHINE FOR SAUSAGES AND VARIOUS BAGGED PRODUCTS

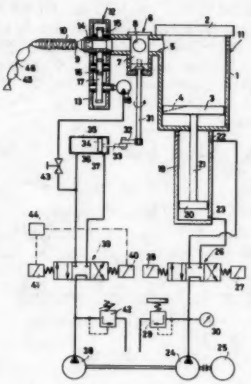
Giovanni B. Righele, Zane, and Giuseppe Scorzato, Marano Vicentino, both of Italy, assignors to Risco Brevetti S.p.A., Italy

Filed Apr. 15, 1987, Ser. No. 38,769

Claims priority, application Italy, May 12, 1986, 20403 A/86

Int. Cl.[4] A22C 11/04

U.S. Cl. 17—33 4 Claims



1. Bagging and apportioning machine for sausages and various bagged products comprising a container for a mass of product to be bagged, a pushing member included in said container to push the product toward an outlet orifice associated with said container, a filling spout communicating with said orifice and cutoff valve placed between said orifice and said filling spout characterized in that it comprises means for driving said pushing member to push the product continuously under constant pressure towards said output orifice and maintaining a constant pressure on said product, and means to alternately move said cutoff valve to an open and a closed position in accordance with predetermined adjustable timed intervals.

4,797,974

FISH FILLET RETAINER DEVICE

Jesse E. Smith, Jr., J & J Special Springs, P.O. Box 520, Waynesville, Ohio 45068

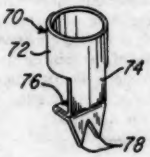
Filed Oct. 30, 1987, Ser. No. 114,728

Int. Cl.[4] A22C 25/06

U.S. Cl. 17—45 7 Claims

1. A fish retainer device for filleting fish, the retainer device being adapted to be carried by a finger of a person's hand, comprising an annular band having an inside dimension substantially equal to the transverse dimension of a finger of a

person's hand, the band having a central axis, a stem attached to the band and having a portion extending longitudinally from the band and parallel to the central axis of the band, a pointed projection extending from the stem and within a plane parallel



to the central axis of the band, the pointed projection being engageable with a fish during filleting of the fish as pressure is applied upon the fish through the stem by a finger which is encompassed by the band.

4,797,975

PROCESS AND PLANT FOR THE TREATMENT OF MEAT OF CATTLE OR OTHER QUADRUPEDS

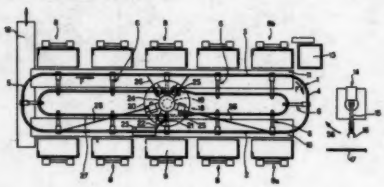
Marcel Soullard, and Victor Brochard, both of Cholet, France, assignors to Boca-Quest, Cholet, France

Filed Jan. 13, 1987, Ser. No. 2,910

Claims priority, application France, Jan. 13, 1986, 8600383

Int. Cl.[4] A22C *17/02*

U.S. Cl. 17—46 **30 Claims**



1. A method for semi-automatic processing quarters of bovine animal or other quadrupeds comprising the steps of:

a. vertically suspending the quarters by a hook means hanging on a first overhead rail assembly;

b. gripping an upper portion of the quarter still hanging by said hook;

c. severing a part of said upper portion of the quarter to free the quarter from said hook;

d. moving the quarter from said first overhead rail assembly to a second overhead rail assembly formed in a closed loop and having a plurality of means for suspending the quarter travelling continuously along said second rail assembly;

e. elevating the quarter until said upper portion can be clamped in one of said suspension means;

f. moving said quarter clamped on said suspension means along said closed loop in front of a plurality of processing stations arranged at intervals along said closed loop;

g. manually separating the muscles and meat from the bones by a plurality of operators without performing a substantial intermediate deboning operation while said quarter is moved along said closed loop, and while permitting a vertical movement in both directions controlled by each operator at each station; and

h. releasing the remaining skeleton from said suspension means at a last station so as to permit the clamping of a new quarter on said suspension means.

4,797,976

TEXTILE FIBER TUFT CLEANING APPARATUS

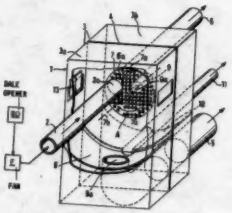
Ferdinand Leifeld, Kempen, and Hermann G. Selker, Mönchengladbach, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed May 7, 1987, Ser. No. 46,868

Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615416

Int. Cl.[4] D01G *9/08*

U.S. Cl. 19—200 **15 Claims**



1. In an apparatus for separating waste from textile fiber tufts including a substantially closed casing, a separating wall arranged in the casing for dividing the casing into a dust and waste collecting chamber and a fiber collecting chamber; said separating wall having a separating surface and being provided with apertures; air stream guide means for directing a fiber and waste-laden air stream through said apertures from the fiber collecting chamber to said waste collecting chamber; said apertures being sized to allow passage of dust and waste and to prevent passage of fibers; said air stream guide means and said separating wall being relatively movable with respect to one another; the improvement wherein said air stream guide means comprises a pressure conduit having an outlet end situated in the fiber collecting chamber at said separating wall, an air pressure generating means communicating with said pressure conduit for driving said fiber and waste-laden air stream through said pressure conduit and out of said outlet end towards said separating surface, and an air suction means including a suction conduit having an inlet opening situated in the waste collecting chamber at said separating wall; said suction conduit being arranged for guiding away dust passing through said apertures; and further wherein said pressure conduit is immovably supported and said separating wall is rotatable about an axis perpendicular to said separating surface of said separating wall; the improvement further comprising an air equalizing opening provided in a wall of said casing.

4,797,977

PICKER ASSEMBLY

David P. Napoleon, and Salvatore J. Centofanti, both of Philadelphia, Pa., assignors to General Felt Industries, Inc., Saddle Brook, N.J.

Filed May 11, 1988, Ser. No. 192,647

Int. Cl.[4] D01B *1/00*; D01G *19/00*

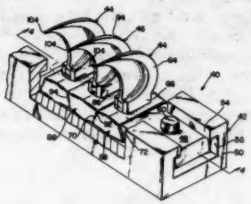
U.S. Cl. 19—97 **15 Claims**

1. A picker assembly comprising:

(a) a linearly extending picker bar having a top wall and a bottom wall, a linearly extending T-slot in said picker bar comprising a head space of a predetermined height between said top wall and said bottom wall and a linearly extending opening through said top wall,

(b) a plurality of picker teeth in said picker bar, each picker tooth having a blade outwardly of said picker bar, a base in said head space and a shank extending through said linear opening in said top wall, the height of said bases being less than the height of said head space, and

(c) means for maintaining each of said bases against one of said top wall or said bottom wall of said picker bar prior



to and upon said blade being subject to forces thereon when striking material.

4,797,978

MULTIPLE-CARD WITH TRANSFERRING, CARDING AND CLEANING CYLINDER

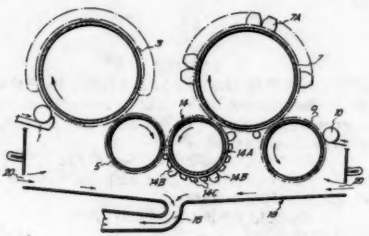
Marcello Giuliani, Via Cellerese No. 33, 50013 Campi Bisenzio, Italy

Filed Jul. 21, 1987, Ser. No. 76,019

Claims priority, application Italy, Jul. 24, 1986, 9445 A/86

Int. Cl.[4] D01G *15/40*

U.S. Cl. 19—98 **3 Claims**



1. A multiple-card, so called "tandem card" for cleaning fibers, comprising:

a first carding drum (3) and a second cascade-arranged carding drum (7), and including a first combing cylinder (doffer) (5) for the first carding drum, and a second combing cyliner (9) for the second carding drum,

transfer means between said first combing cylinder and said second carding drum consisting essentially of at least one cylinder (14) for further doffing, carding and cleaning fibers fed thereto,

said at least one cylinder (14) having a clothing (14A) for carding, thinning and cleaning and arranging said fibers in parallel and having cooperably associated therewith caps or flats (14B) and cleaning blades (14C),

said at least one cylinder (14) being disposed in a zone below said carding drums (3) and (7), at which zone cleaning of the fibers is effected by gravity and centrifugal force.

4,797,979

ARRANGEMENT FOR SUPPLYING A FIBER PROCESSING MACHINE

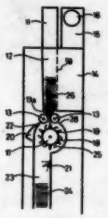
Paul Stäbeli, Wilen b/Wil, and Fritz Knabenhans, Winterthur, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jul. 6, 1987, Ser. No. 70,028

Claims priority, application Switzerland, Jul. 8, 1986, 02751/86

Int. Cl.[4] D01G *15/40*

U.S. Cl. 19—105 **11 Claims**



1. An arrangement for supplying a fiber processing machine, for example a card, with fiber flock material, comprising:

a feed device containing two feed rollers cooperating with one another to form therebetween a nip;

a rotatable substantially cylindrical opening roller having an outer surface and coacting with said two feed rollers;

said two feed rollers serving to feed fiber flock material to said rotatable substantially cylindrical opening roller;

said rotatable substantially cylindrical opening roller being provided with needles distributed over said outer surface thereof;

said needles extending outwardly from said outer surface of said substantially cylindrical opening roller;

a feed chute cooperating with said substantially cylindrical opening roller and having an entrance location;

said substantially cylindrical opening roller being located at the region of said entrance location of said feed chute;

said substantially cylindrical opening roller being provided with substantially strip-shaped vanes located between said needles on said outer surface of said substantially cylindrical opening roller;

said outer surface of said substantially cylindrical opening roller being defined by generatrices;

each of said substantially strip-shaped vanes having at least one lengthwise extending side;

said substantially strip-shaped vanes being fixedly secured to said outer surface of said substantially cylindrical opening roller along said at least one lengthwise extending side and extending outwardly from said outer surface of said substantially cylindrical opening roller and substantially parallel to said generatrices;

each of said needles having a predeterminate height from the outer surface of said substantially cylindrical opening roller;

each of said substantially strip-shaped vanes having a predeterminate height from the outer surface of said substantially cylindrical opening roller; and

the predeterminate height of said substantially strip-shaped vanes being less than the predeterminate height of said needles.

4,797,980

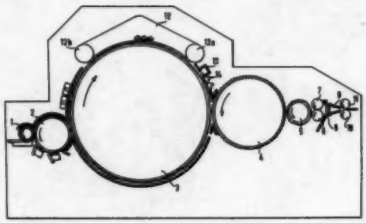
WASTE SEPARATOR FOR A CARD

Peter Jagst, Mönchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. Kg, Mönchengladbach, Fed. Rep. of Germany

Continuation of Ser. No. 688,893, Jan. 4, 1985, abandoned. This application Jun. 19, 1987, Ser. No. 67,411

Int. Cl.[4] D01G *15/80*

U.S. Cl. 19—107 8 Claims



1. In a card including a main carding cylinder having a direction of rotation, a doffer cooperating with the main carding cylinder and a waste separator situated above the doffer and adjacent the main carding cylinder; the waste separator including a knife blade situated close to the main carding cylinder and being oriented in a direction opposite said direction of rotation, a plate situated at a small radial distance from the main carding cylinder and having an edge defining a gap with the knife blade and a casing defining a suction chamber shrouding said gap; the improvement wherein said casing and said knife blade are formed of a single-piece component.

4,797,981

PROCESS FOR THE PRODUCTION OF SALT

Léon Ninane, and Claude Breton, both of Dombasle-sur-Meurthe, France, assignors to Solvay & Cie (Societe Anonyme), Brussels, Belgium

Continuation of Ser. No. 721,803, Apr. 10, 1985, abandoned. This application Dec. 8, 1986, Ser. No. 940,220

Claims priority, application France, Apr. 16, 1984, 84 06097

Int. Cl.[4] B01D *9/00*; C01D *3/06*

U.S. Cl. 23—303 9 Claims

1. Process for the production of salt, comprising:

subjecting a sodium chloride brine to crystallization by evaporation under conditions which result in the formation of sodium chloride having the form of spheres; and

breaking up the spheres to provide said salt, which salt has a translucent and glassy appearance, a particle shape of broken spheres, a non-uniform particle size, and a mean diameter ranging from 1.00 to 2.50 mm.

4,797,982

POCKET CLIP FOR WRITING INSTRUMENTS

Dieter Eylers, and Hans Bamberger, both of Idar-Oberstein, Fed. Rep. of Germany, assignors to Gottlieb Roll GmbH & Co., Idar-Oberstein, Fed. Rep. of Germany

PCT No. PCT/EP87/00042, § 371 Date Aug. 6, 1987, § 102(e) Date Aug. 6, 1987, PCT Pub. No. WO87/04667, PCT Pub. Date Aug. 13, 1987

PCT Filed Jan. 30, 1987, Ser. No. 131,190

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1986, 3603876

Int. Cl.[4] B43K *25/00*

U.S. Cl. 24—11 R 6 Claims

1. A pocket clip for a writing instrument, such as a ball-point pen, fountain pen cap, or the like, comprising: a clasp of spring-elastic strip material having a resilient tongue with a free end; an elongated facing disposed on said tongue, and stamped from thin metal material, said facing having a substantially planar elongated web and two low marginal flanges respectively formed on lateral margins of said web and extending away therefrom; at least one holding bead extending from each of said marginal flanges over a portion of the length of the respective marginal flange and bent toward the other holding bead; there being a free space between the web and the beads, said free space being approximately equal to or only slightly greater than the thickness of the resilient tongue and the width of the facing being slightly less than the free width between the marginal flanges, so that the free end of the tongue is insertable into the space between the web and the flanges; the facing

having an upper end to be fastened to the writing instrument, and two tabs at said upper end, formed on the flanges and having free ends bent to a position in which they point toward one another, said tabs having bottom transverse edges and being so disposed that in a fastening position of the clip the resilient tongue in locked against withdrawal from said facing by said edges; the width of the beads being such that a narrow, slot-like interstice remains therebetween, the tongue having at least one first projection which, in the fastening position, protrudes above and directly behind the bead opposite the end of insertion of the tongue, said first projection having a diameter greater than the width of the slot-like interstice.

4,797,983

CONNECTORS FOR INSERT MOULDING IN PANELS

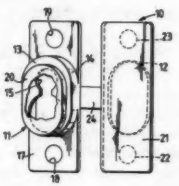
Barry R. M. Barnett, and David C. Ellis, both of Buckinghamshire, England, assignors to TRW United-Carr Limited, Inc., Buckinghamshire, England

Filed Feb. 24, 1987, Ser. No. 17,522

Claims priority, application United Kingdom, Feb. 25, 1986, 8604595; Jul. 29, 1986, 8618406

Int. Cl.[4] E04B *1/38*; B62D *27/04*

U.S. Cl. 24—289 14 Claims



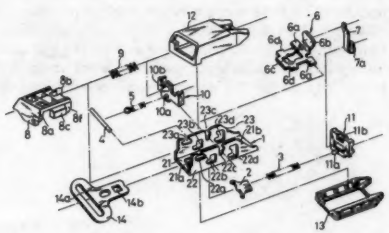
1. A moulded plastics socket connector for insert moulding in a panel comprising a hollow boss having a substantially flat end wall and a continuous side wall, a slot in the end wall, a raised membrane of material overlying and closing the slot and a closure shaped and adapted to be press-fitted into the hollow boss to close the end of the boss opposite to the end wall.

4,797,984

SEAT BELT BUCKLE

Toshiaki Seto, and Masaru Morinaga, both of Kanagawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1987, Ser. No. 68,344
Claims priority, application Japan, Jul. 7, 1986, 61-103115[U]
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—641 7 Claims



1. A buckle comprising:

a base having a bottom wall portion and side wall portions extending upright in a face-to-face relation from opposing side edges of the bottom wall portion respectively, said side wall portions defining substantially L-shaped holes therethrough, each of said substantially L-shaped holes having a horizontal portion which extends essentially parallel to the bottom wall portion, and a vertical portion which extends essentially perpendicular to the bottom wall portion;

a latch piece supported on the side wall portions of the base rockingly between a tongue latching position and a tongue non-latching position;

a holding member received at both end portions thereof in the substantially L-shaped holes, said holding member being displaceable between a holding position, where the end portions of the holding member are in the horizontal portions of the corresponding L-shaped holes so as to hold at the tongue latching position the latch piece which has been in the tongue latching position, and a non-holding position where the end portions of the holding member are in the vertical portions of the corresponding L-shaped holes so as to permit movement of the latch piece from the tongue latching position;

a first spring for biasing the holding member toward the holding position;

a release member slidably mounted on said base and displaceable between a non-operated position and an operated position and adapted to bring the holding member to the non-holding position and the latch piece to the tongue non-latching position when the release member assumes the operated position, said release member comprising a means for covering substantially an entire part of the vertical portion of at least one of the L-shaped holes so as to prevent the holding member form moving to the non-holding position when the holding member assumes the holding position; and

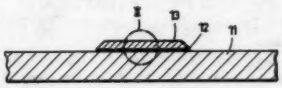
a second spring for biasing the release member toward the non-operated position.

4,797,985

METHOD OF APPLYING A METALLIC GUIDE BAND TO A THIN-WALLED PROJECTILE BODY

Jürgen Prochnow; Jörg Peters, both of Düsseldorf; Ulrich Theis, Mülheim, and Klaus D. Karius, Jüchen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 6, 1986, Ser. No. 927,556
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1985, 35310
Int. Cl.[4] B21K *21/06*
U.S. Cl. 29—1.21 22 Claims



1. A method of applying a metallic guide band to a thin-walled projectile body of refined steel comprising the following steps:

(a) roughening a circumferential ungrooved surface portion of the projectile body by blasting said surface portion with a fine-grained material of greater hardness than the material of the projectile body;

(b) subsequent to the roughening step, applying a bonding layer of preheated fine solid particles to the ungrooved roughened surface portion;

(c) heating fine metal particles at a temperature effective to obtain solely a surface plastification of the fine metal particles; and

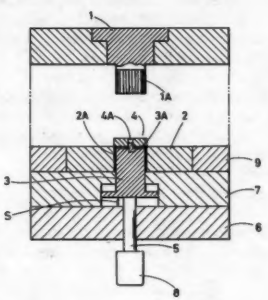
(d) subsequent to the step of applying the bonding layer, spraying the heated fine metal particles onto said bonding layer to form said guide band, bonded to said projectile body by said bonding layer.

4,797,986

SPUR GEAR MANUFACTURING PROCESS

Michihiro Yokoyama, Anjyo, Japan, assignor to Kabushiki Kaisha Yokoyama Seisakusho, Anjo, Japan

Filed Jun. 18, 1987, Ser. No. 63,472
Claims priority, application Japan, Jun. 20, 1986, 61-145094
Int. Cl.[4] B21D *53/28*
U.S. Cl. 29—159.2 1 Claim



1. A manufacturing process for cold-press molding spur gears which comprises:

(a) loading a pre-punched workpiece having a top to bottom orientation on a counter which is located in a bore of a female die, said bore having a chamfer at one end and a tooth profile located on an interior portion of said bore;

(b) pressing the workpiece completely through the chamfer with a punch such that the punch descends into the die only part of the way through the die so that said counter

does not make contact with a counter plate, said pressing step producing a primary product;

(c) extracting the primary product from the female die with the counter and reversing the counter's top to bottom orientation, thereby completing a first step;

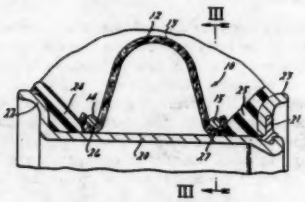
(d) loading said primary product on the counter, pressing the primary product with the punch into the female die and thereafter, removing a resultant high precision spur gear from the die with the counter.

4,797,987

METHOD OF ASSEMBLING A BEAD LOCK DEVICE AND PNEUMATIC TIRE

John W. Bush, Roseville, Mich., assignor to The Budd Company, Troy, Mich.

Division of Ser. No. 772,006, Sep. 3, 1985, Pat. No. 4,674,549.
This application May 22, 1987, Ser. No. 53,276
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—433 **14 Claims**



1. A method of making a bead lock device for a pneumatic tire to be mounted on a wheel of a given diameter having outer flanges, said method comprising:

providing a plurality of general U-shaped flexible bows with reverse curl means at each end and a pair of flexible rods, attaching said reverse curl means of said plurality of generally U-shaped flexible bows to spaced locations on said pair of flexible rods, and joining opposite ends of said rods together to form hoops having a diameter slightly larger than the diameter of the wheel thereby providing an annular structure.

10. A method of assembling a pneumatic tire comprising:

providing a pneumatic tire having mounting beads, a wheel on which said pneumatic tire is to be mounted, the wheel having flanges, a plurality of generally U-shaped flexible bows, and a pair of flexible rods,

attaching opposite ends of said plurality of U-shaped flexible bows to spaced locations on said flexible rods;

joining opposite ends of said rods together to form hoops having a diameter slightly larger than the diameter of said wheel to provide an annular structure;

inserting said structure into said pneumatic tire; mounting said pneumatic tire with said structure onto said wheel; and

compressing said bows when said tire is assembled onto said wheel whereby the bows urge the tire beads against the wheel flanges.

4,797,988

METHOD AND TOOL FOR PREPARING MULTI-CONDUCTOR CABLE

Wade R. Bowden, Jr., Northport, and Yully Rushansky, Port Washington, both of N.Y., assignors to Slater Electric, Inc., Glen Cove, N.Y.

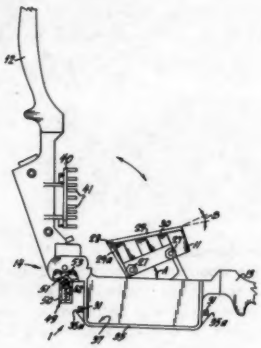
Filed Mar. 27, 1986, Ser. No. 844,841
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—566.4 **14 Claims**

1. A tool for slicing through the outer protective sheath of an electrical power cable and spreading apart individual conductors of the cable, said tool comprising:

a pair of arm members pivotally connected at one end and having hand-gripping portions near their other ends;

a cutter assembly mounted to one of said arm members, said cutter assembly including a pair of parallel cutter blades each having a principal cutting edge, with a spacer therebetween to maintain a predetermined spacing between the blades and a pair of triangularly shaped spreader/blade-support members both for mounting the blades to the tool about the spacer, and also for causing individual conductors of the cable to be spread away from its central ground during closure of said arms; and

an anvil member mounted to the other of said arm members for co-action with the cutter assembly when the tool is closed, said anvil providing a cable support surface for supporting the cable during the sheath slicing and conductor spreading operations, and said anvil including (i) means for locating the cable in proper orientation relative



to said cutter blades when said tool is closed, (ii) a central support rib extending parallel to the cable when properly located on said anvil to support a central conductor of the cable during the sheath slicing and conductor spreading operation, and (iii) slots on either side of said central support rib, said slots proportioned to permit the cutter blades and spreader/blade-support members to pass through the cable support surface while the cable remains supported thereon;

wherein said cutter assembly is mounted to the tool such that the principal cutting edges move past the anvil support surface at a gradually decreasing angle, in scissor-like manner, for a generally uniform force exertion over the slicing and spreading stroke of the tool

wherein each said spreader/blade-support member includes a base segment and a plurality of triangularly shaped segments upstanding therefrom, and wherein said spacer is formed integrally with the tool arm member to which said cutter assembly is mounted, such that said cutter assembly is mounted to the tool by direct attachment to the spacer.

4,797,989

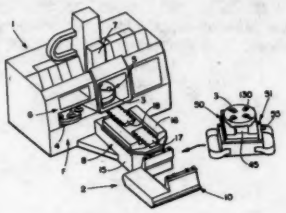
COMBINATION MACHINE TOOL APPARATUS AND PALLET CHANGING SYSTEM

Carl F. Cherko, Euclid, Ohio, assignor to Oerlikon Motch Corporation, Cleveland, Ohio

Filed Feb. 5, 1987, Ser. No. 11,146
Int. Cl.[4] B23Q *41/02, 7/00*
U.S. Cl. 29—568 **53 Claims**

1. In combination, a machine tool apparatus and pallet changing system, said machine tool apparatus including a work piece machining station and a tool storage station, and a tool spindle movable between said stations, and said pallet changing

system including a pallet changer having pallet support means for supporting pallets at opposite ends thereof, means for indexing said pallet support means to position either end thereof



at either of said stations on said machine tool apparatus, and means for transferring pallets between said pallet changer and either of said stations.

4,797,990

VERTICAL MACHINING CENTER WITH A ROTARY PALLET CHANGER

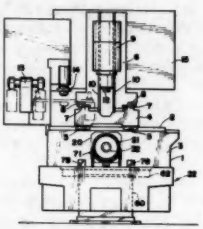
Yoshinori Yamaguchi, Sakuraishi; Soichi Nishiyama, Nagagun; Norihide Maeda, Kashiwarashi, and Masayasu Miyoshi, Yamatokoriyamashi, all of Japan, assignors to Kabushiki Kaisha Mori Seiki Seisakusho, Nara, Japan

Filed Oct. 5, 1987, Ser. No. 104,383

Claims priority, application Japan, Oct. 24, 1986, 61-254299

Int. Cl.[4] B23Q *3/156*; B23C *1/14*

U.S. Cl. 29—568 **2 Claims**



1. A vertical machining center the vertical machining center comprising:

a machine bed having a front face;

a pallet clamp unit provided along the front face of the bed, the pallet clamp unit holding a pallet in a vertical position, and being capable of rotating around a horizontal axis;

a rotary pallet changer provided in front of the front face of the bed;

a saddle provided on an upper surface of the bed, the saddle being slidable along an X axis;

a column provided on a top surface of the saddle, the column being slidable along a Y axis;

a headstock provided on a front face of the column, the headstock being slidable along a Z axis;

a tool magazine and an automatic tool exchange device. arranged alongside the bed; and

a numerical control unit for numerically controlling the saddle, the column, the headstock, the pallet clamp unit, the rotary pallet changer, the tool magazine and the automatic tool exchange device.

4,797,991

VERTICAL MACHINING CENTER

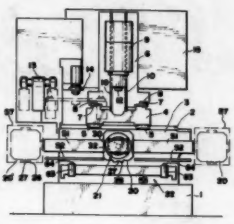
Yoshinori Yamaguchi, Sakuraishi; Soichi Nishiyama, Nagagun; Norihide Maeda, Kashiwarashi, and Masayasu Miyoshi, Yamatokoriyamashi, all of Japan, assignors to Kabushiki Kaisha Mori Seiki Seisakusho, Nara, Japan

Filed Oct. 5, 1987, Ser. No. 104,270

Claims priority, application Japan, Oct. 24, 1986, 61-254298

Int. Cl.[4] B23Q *3/156*; B23C *1/14*

U.S. Cl. 29—568 **4 Claims**



1. A vertical machining center comprising:

a bed including a substantially vertically extending front face;

a pallet clamp unit and a pallet conveyor unit arranged along the front face of the bed;

a saddle provided on an upper surface of the bed, the saddle being slidable along an X axis;

a column provided on a top surface of the saddle, the column being slidable along a Y axis;

a headstock provided on a front face of the column, the headstock being vertically slidable;

a tool magazine and an automatic tool exchange device, both being arranged alongside the bed; and

a numerical control unit for numerically controlling the saddle, the column, the headstock, the pallet clamp unit, the pallet conveyor, the tool magazine and the automatic tool exchange device.

4,797,992

METHOD OF MAKING A THIN FILM INTEGRATED MICROCIRCUIT

Vernon B. Powers, and Deborah C. Murphy, both of W. Melborne, Fla., assignors to Hercules Defense Electronics Systems Inc., Clearwater, Fla.

Division of Ser. No. 9,864, Feb. 2, 1987, Pat. No. 4,740,762. This application Dec. 28, 1987, Ser. No. 137,997

Int. Cl.[4] H01P *11/00*

U.S. Cl. 29—600 **9 Claims**

1. A method of fabricating a microwave integrated circuit comprising the steps of:

providing a planar substrate of insulating material,

boring a hole of predetermined diameter in said substrate,

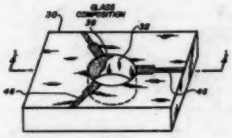
providing a planar disc of magnetically permeable material having a diameter substantially equal to said predetermined diameter and a circumferential perimeter,

coating said hole and said perimeter of said disc with a thermally fusable dielectric composition,

embedding said disc in said hole,

heating said substrate to a predetermined temperature for a time period sufficient to crystalize said composition and fuse said disc to said substrate,

polishing at least one face of said substrate and said disc to provide a planar surface, and



metalizing and selectively patterning said disc in regions of said face with a conductive material.

4,797,993

METHOD OF MAKING ELECTROWELDABLE SOCKETS

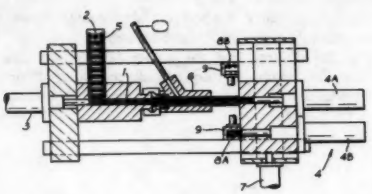
David M. A. Kenworthy, Barnsley; Eric Bridgstock, Derbyshire, and Edwin A. W. Dunkley, Sheffield, all of England, assignors to Fusion Plastics Limited, Chesterfield, England

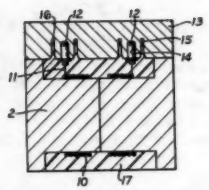
Filed Jul. 17, 1987, Ser. No. 74,949

Claims priority, application United Kingdom, Jul. 26, 1986, 8618285

Int. Cl.[4] H01C *17/02, 17/04, 17/28;* B23P *19/04*

U.S. Cl. 29—613 **12 Claims**





1. A method of manufacture of an electroweldable socket comprising, winding a length of electrical resistance wire on to a transversely-split bobbin-type mandrel with a body part between flanged ends, leaving the ends of the wire upstanding from the body part of the mandrel, passing the mandrel through the head of an extrusion plastic processing machine to deposit plastic material around the body part of the mandrel between the flanged ends, and to leave exposed the ends of the wire passing through the wall of the socket, and removing the split mandrel from within the socket after it has emerged from the extrusion head, leaving the winding of resistance wire embedded in the surface of the bore of the socket.

4,797,994

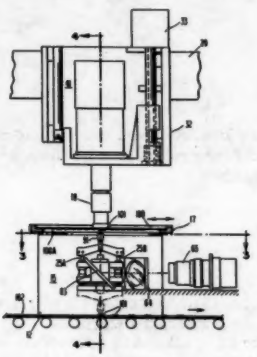
APPARATUS FOR AND METHODS OF DIE BONDING

Gerard H. Michaud, Furlong; James H. Graham, Pottstown, both of Pa., and Roger P. Stout, Chandler, Ariz., assignors to Kulicke & Soffa Industries, Inc., Willow Grove, Pa.

Continuation of Ser. No. 863,590, May 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 855,009, Apr. 22, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 172,982

Int. Cl.[4] H05K *13/04*

U.S. Cl. 29—720 **17 Claims**



1. An apparatus for removing a die from a film mounted wafer containing a plurality of dice and bonding the die to a bond site on a substrate having a plurality of bond sites thereon, said apparatus comprising:

(a) component holding means for holding the wafer in a first plane and moving the wafer within said first plane so as to place the die at a pickup location;

(b) substrate holding means for holding the substrate in a second plane spaced from and parallel to said first plane and moving the substrate so as to place the bond site at a bond location;

(c) optical means for sensing the position of said die, including mirror means located between said first and second planes for directing light towards and away from said die; and

(d) a die bond head between said first and second planes rotatable about an axis parallel to said first and second planes, including a bond head housing and a die engaging tool movably mounted to said housing such that rotation of said housing does not interfere with said optical means.

4,797,995

METHOD OF FABRICATING A HOLLOW SQUARAX INNER CONDUCTOR

Stanley S. Chang, Palos Verdes Estates; Robert E. Jones, Woodland Hills, and Hui Bau, Hermosa Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 8, 1986, Ser. No. 939,322

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—825 **12 Claims**

1. A method of fabricating a hollow rectangular tube having highly accurate first and second outer dimensions comprising the steps of:

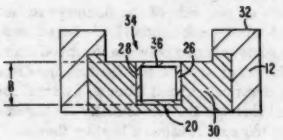
removing material from a first surface of a metal base plate to form a first "u" shaped slot having the desired inner dimensions of said tube;

joining a cover plate having a thickness greater than the desired wall thickness of said tube to said slotted surface of said base plate;

removing material from the area of said cover plate covering

said first slot to define a first wall of said tube having the desired thickness, said area being at least as wide as said first outer dimension;

removing material from said base plate and any remaining portion of said cover plate to form second and third "u" shaped slots on opoosite sides of said first slot, said second and third slots being parallel to said first slot and spaced from each other to define respective second and third walls of said tube spaced at said first outer dimension and having the desired thickness, each of said second and third slots having a depth from said first wall greater than said second outer dimension of said tube;



casting a sacrificial metal into at least said second and third slots, said sacrificial metal having a melting point lower than the melting point of said base plate metal;

removing sufficient material from a second surface of said base plate opposite said first plate surface to form a fourth wall of said tube having the desired thickness and thereby exposing said fourth wall to a width of at least said first outer dimension; and

heating the remaining portion of said base plate and said sacrificial metal to remove unwanted portions of said base plate and sacrificial metal and thereby form said hollow rectangular tube.

4,797,996

DEVICE FOR CENTERING PREFORMED COMPONENTS FOR THE FLAT IMPLANTATION THEREOF BY MEANS OF AN AUTOMATIC SETTING MACHINE

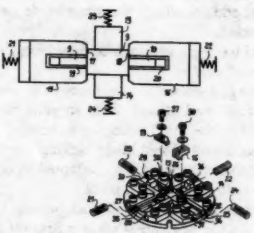
Claude Lobry, Genlis, and Didier Trutt, Auxonne, both of France, assignors to Societe Orega Electronique Et Mecanique, Paris, France

Filed Aug. 24, 1987, Ser. No. 88,310

Claims priority, application France, Aug. 25, 1986, 86 12042

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—740 **5 Claims**



1. A device for centering components encapsulated in a chip carrier having substantially parallelpipedic sides and having at least one connection pin or lug on at least one of the sides of the carrier other than the top and bottom thereof, comprising:

two mutually perpendicular pairs of jaws, each of said pairs of jaws being movable such that at least one surface of each jaw of said two pairs of jaws engages one of the sides of a component supported by a supporting means;

at least one recess formed in said at least one surface of each jaw of one of said pairs of jaws, each said recess having such a size and being formed at such a position on said at least one surface that said jaw does not engage a connection pin or lug extending from the side engaged by said at least one surface; and

means for moving said jaws, comprising a carriage guided by lateral rails perpendicular to each other two by two and carried by a plate.

4,797,997

DRY SHAVERS

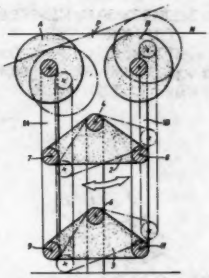
Charles C. Packham, Crowthorne; Robert White, Chelsey, and Steven Rogers, Hurstpierpoint, all of England, assignors to The Gillette Company, Boston, Mass.

Filed Nov. 4, 1987, Ser. No. 117,176

Claims priority, application United Kingdom, Nov. 7, 1986, 8626631

Int. Cl.[4] B26B *19/02*

U.S. Cl. 30—43.92 **9 Claims**



1. A dry shaver comprising a shaver frame, a pair of generally vertical, parallel side members mounted on said frame for vertical movement relative to each other and relative to said frame whilst constrained to remain parallel with each other, said side members being coupled together below their upper ends by at least one transverse link whose opposite ends are pivotally connected to the respective side member and which is pinned intermediate its ends to said frame for pivotal movement about an axis, and a pair of parallel, elongate shaver heads mounted on the respective upper ends of said side members, for movement relative to said shaver frame, each said shaver head comprising an outer foil and a reciprocating inner cutter mounted independently on said frame.

4,797,998

LOCKABLE PIVOTABLE RAZOR

Vincent C. Motta, West Norwalk, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 8, 1986, Ser. No. 936,435

Int. Cl.[4] B26B *21/14*

U.S. Cl. 30—87 **35 Claims**

1. A razor handle for mating with a pivotable razor cartridge comprising:

(a) a bottom frame;

(b) a top frame mated to said bottom frame;

(c) attachment means allowing pivotable movement of said cartridge in the direction of shaving in response to shaving forces on the cartridge bottom;

(d) biased cam follower means for engagement with a V-shaped cam on the cartridge bottom said cam follower,

said cam follower means linearally reciprocally moveable against said bias within said frame; and

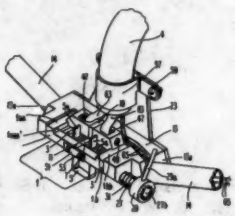
(e) locking means including a slideably mounted member within said frame for preventing cartridge pivoting.

4,797,599

CUTTING HEAD MEMBER FOR RESISTANCE-HEATED TIRE GROOVER

Guy A. Van Alstine, 27 West Cherry Ave., Trappe, Pa. 19426

Filed Sep. 11, 1987, Ser. No. 96,360
Int. Cl.[4] B29D *30/68*
U.S. Cl. 30—140 11 Claims



1. A cutting head member for holding the ends of a substantially U-shaped metal cutting blade in a resistance-heated tire groover, comprising:

a. a metal housing divided into a first subhousing and a second sub-housing, the first and second subhousings having a longitudinal channel formed therein, and the first and second sub-housings being adapted to be connected to an external source of electrical current;

b. at least one stationary insulator interposed between the first and second sub-housings so that the first and second sub-housings are electrically insulated from each other;

c. head holder means for holding the first subhousing rigidly in engagement with the second sub-housing with the stationary insulator interposed there between, so that the first and second sub-housings are electrically insulated from each other;

d. a plurality of metal clamping spacers slidably interposed within the longitudinal channel formed in the first and second sub-housings, for the purpose of engaging the ends of a substantially U-shaped cutting blade interposed between said metal clamping spacers;

e. a floating insulator slidably interposed within the longitudinal channel formed in the first and second subhousings, said floating insulator separating the plurality of metal clamping spacers so that the metal clamping spacers on one side of said floating insulator are electrically insulated from the metal clamping spacers on the other side of said floating insulator, in that the metal clamping spacers on one side of said floating insulator are in contact only with each other and with the first sub-housing, while the metal clamping spacers on the other side of said floating insulator are in contact only with each other and with the second sub-housing, thereby allowing electrical current from an external source to be conducted through a substantially U-shaped metal cutting blade having one of its ends interposed between the metal clamping spacers on one side of said floating insulator and the other of its ends interposed between the metal clamping spacers on the other side of said floating insulator; and

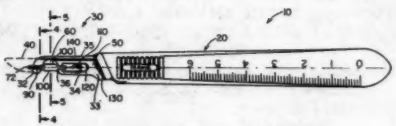
f. tightening means for tightening the metal clamping spacers and the floating insulator against each other and against the ends of a substantially U-shaped metal cutting blade so that one end of the substantially U-shaped metal cutting blade is rigidly retained between the metal clamping spacers on one side of the floating insulator and the other end of the substantially U-shaped metal cutting blade is rigidly retained between the metal clamping spacers on the other side of the floating insulator, thereby allowing electrical current from an external source to be conducted through the substantially U-shaped metal cutting blade to cause resistance heating therein.

4,798,000

CUTTING BLADE ASSEMBLY

Richard J. Bedner, 113 Smoke Rise Dr., Warren, N.J. 07060, and Emil Yerman, 2348 Terrace Ave., South Plainfield, N.J. 07080

Filed Feb. 13, 1987, Ser. No. 14,589
Int. Cl.[4] B26B *1/10*
U.S. Cl. 30—339 11 Claims



1. A cutting blade support assembly including

an elongated blade support member adapted to be carried in the hand, said blade support member having a rear end and a front end on which a cutting blade can be detachably supported,

said front end having a top surface on which a cutting blade can be seated, and

a blade locking member in the form of a wall extending along the front end of said blade support member generally parallel to the longitudinal axis thereof,

a portion of said wall of said blade locking member having a T-shaped cross section which is adapted to be engaged by a blade to hold the blade in place,

the T-shape including a vertical wall having an upper end from which a top horizontal surface extends and provides lips on either side of said vertical wall, said lips being adapted to be engaged by a blade, and

a slot in said front end of said blade support member and extending therethrough from said top surface thereof to the bottom surface thereof in alignment with said horizontal lips, said vertical wall extending longitudinally across said slot and said lips vertically overlying and lying across said slot,

whereby said T-shaped locking member may be formed by a two-part mold including cooperating members forming said slot, said vertical wall and said locking member lips.

4,798,001

SAW BLADE FOR A SAW HAVING RECIPROCATING BLADES

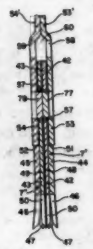
Horst Grossmann, Hunfelden, and Ernst Staas, Brechen, both of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.

Filed Oct. 30, 1987, Ser. No. 115,936

Claims priority, application European Pat. Off., Nov. 11, 1986, 86115651.1

Int. Cl.[4] B27B *19/02*

U.S. Cl. 30—355 8 Claims



1. A saw blade for a power saw having two such blades arranged adjacent and parallel to each other and reciprocating in opposite directions, said saw blade comprising;

an elongate blade member extending in a longitudinal direction and having a top edge, saw teeth along a bottom edge, an outside surface extending between said top and bottom edges on one side of said blade member, and an inside surface extending between said top and bottom edges on an opposite side of said blade member;

said outside surface being formed with a longitudinal shoulder partway between said top and bottom edges and extending in said longitudinal direction, said shoulder facing upwardly away from said bottom edge;

said teeth comprising first, second and third types of teeth;

said first type of teeth being located at said outside surface and being set outwardly to project beyond said outside surface;

said second type of teeth comprising non-set teeth located at said inside surface and being ground from bottoms thereof upwardly and outwardly with respect to said blade member;

said third type of teeth having upper roots located further outwardly towards said outside surface than roots of the second type of teeth, said third type of teeth being set inwardly but not projecting beyond the teeth of said second type; and

the three types of teeth cooperating when cutting a workpiece to bias said bottom edge to move in a direction from said outside surface towards said inside surface, the first type of teeth being subjected to forces acting outwardly away from said inside surface and the second and third types of teeth being subjected to forces acting inwardly towards said inside surface to produce a resultant force acting on all three types of teeth which is directed inwardly towards said inside surface.

4,798,002

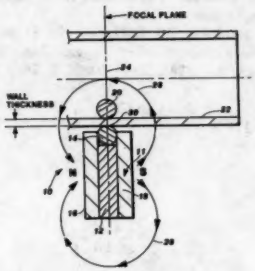
WALL THICKNESS MEASURING METHOD AND APPARATUS

Leander J. Salzer, and Donald A. Bergren, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 6, 1987, Ser. No. 105,154

Int. Cl.[4] A45B *3/08*

U.S. Cl. 33—125 A 31 Claims



1. An apparatus for use in conjunction with an optical comparator to measure a nonmagnetic article having an aperture therein so as to determine the wall thickness of the article, the optical comparator having a support member which can be vertically displaced, the apparatus comprising:

support means for supporting said article:

a ball of known diameter for positioning within said aperture; and

a magnet contiguous with said support means and producing a magnetic field sufficient to retain said ball positioned within said aperture directly above said support means.

4,798,003

THREAD MEASURING DEVICE

Ingvar Haglöf, Strömvägen 56, S-882 00 Langsele, Sweden

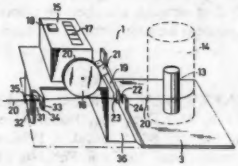
PCT No. PCT/SE86/00560, § 371 Date Jul. 22, 1987, § 102(e) Date Jul. 22, 1987, PCT Pub. No. WO87/03675, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 9, 1986, Ser. No. 87,679

Claims priority, application Sweden, Dec. 16, 1985, 8505944

Int. Cl.[4] G01C *15/00*

U.S. Cl. 33—134 R 5 Claims



1. A thread meter comprising: a holder for a thread reel, a counter with a rotary measuring wheel and plural guides for a thread, and an outer casing with two portions to contain said reel, said counter and measuring wheel, and said guides, the improvement comprising: a first guide (19) of said plural guides for a thread (20) being located within said casing between said reel holder (13) and said measuring wheel (16); a second of said guides, guide (26) for the thread is formed by the two portions of said casing (4,6), a first portion (4) and a second portion (6), which are hingedly interconnected; said first portion (4) having an end wall with a top edge (27) and having a recess (26)

extending from said edge (27); and said second portion (6) of the casing being constructed, when said casing portions are hingedly closed, to bridge the opening (28) of the recess (26) along said edge (27), whereby said recess and said bridge form a hole with a closed periphery, and the periphery of said wheel (16) being located within said casing along a line extending between said two guides (19', 26, 30').

4,798,004

DISPLACEMENT DETECTING APPARATUS

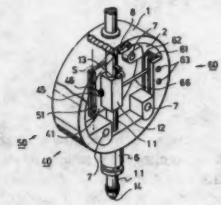
Mikio Suzuki, Kawasaki, Japan, assignor to Mitutoyo Corporation, Tokyo, Japan

Filed Jan. 10, 1987, Ser. No. 61,070

Claims priority, application Japan, Jun. 13, 1986, 61-90939[U]; Jun. 13, 1986, 61-90940[U]; Jun. 18, 1986, 61-92919[U]

Int. Cl.[4] G01B *3/22*

U.S. Cl. 33—172 E **11 Claims**



1. A displacement detecting apparatus comprising:

a case body;

a spindle having a measuring element slidably supported on said case body;

means for detecting a moving displacement of said spindle in the axial direction thereof, said detecting means including a first sensing member having predetermined patterns formed thereon and a second sensing member opposed to said first sensing member and integrally secured to said spindle;

a position checker provided on said second sensing member, including a through-hole having a reference line which extends in a direction parallel to the axial direction of said spindle, said position checker allowing visual inspection of the patterns of said first sensing member from a direction opposite to said first sensing member and ascertaining a positional relationship between said second sensing member and said first sensing member; and

said first sensing member being supported by said case body after said first sensing member is positionally adjusted with said second sensing member secured to said spindle.

4,798,005

COMPONENT PIANO STRING ANGLE GAUGE

Thomas A. Lowell, 7482 Rapp Ln., Talent, Oreg. 97540

Continuation of Ser. No. 880,921, Jul. 1, 1986, abandoned. This application May 10, 1988, Ser. No. 191,713

Int. Cl.[4] G01C *9/00*

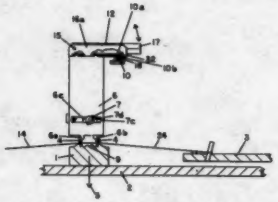
U.S. Cl. 33—386 **6 Claims**

1. A component piano string angle gauge, for piano strings which strings each comprise a front string, a bridge string segment where the piano string is in contact with a piano bridge, and a rear string, for use in the measurements of angles between the front strings and rear strings and a projected line between a pair of bridge string segment termination points, the bridge string segment termination points being the location of the intersection between the front and rear strings and the bridge string segment, said component piano string angle gauge comprising:

a. a base;

b. two gauging fingers, extending from the base, having string contacting bearing surfaces on their ends;

c. means for adjusting the relative distance between the two gauging fingers, whereby the relative distance between the gauging fingers may be increased or decreased so as to allow placement of the string contacting bearing surfaces



of the gauging fingers at the bridge string segment termination points;

d. angle measuring means mounted to said base; and

e. means for calibrating said angle measuring means relative to the position of the string contacting bearing surfaces of the gauging fingers.

4,798,006

VIBRATION ISOLATION MEANS

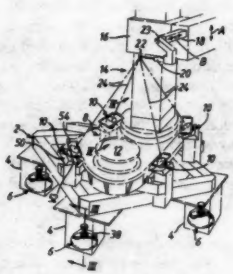
Anthony B. Barnaby, Leicester, England, assignor to Rank Taylor Hobson Limited, United Kingdom

Filed Feb. 24, 1987, Ser. No. 18,021

Claims priority, application United Kingdom, Feb. 25, 1986, 8604596

Int. Cl.[4] G01B *21/00*

U.S. Cl. 33—573 **24 Claims**



1. Apparatus for carrying out an operation on an object, comprising:

a base for supporting the object;

a device connected to said base for performing said operation in a defined zone of operation;

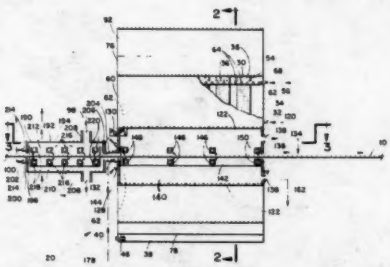
a plurlaity of base isolating mounts each having a higher stiffness in a first direction than in a second direction transverse to said first direction, said base isolating mounts being connected to said base so that said first directions of said base isolating mounts converge in said zone of operation; and

means for supporting said base isolating mounts on a floor so that said base is supported through said base isolating mounts.

4,798,007
EXPLOSION-PROOF, POLLUTION-FREE INFRARED DRYER

John E. Eichenlaub, 9426 Beverly La., Sanibel Island, Fla. 33957

Filed May 28, 1987, Ser. No. 54,999
Int. Cl.[4] F28B 3/28
U.S. Cl. 34—4 36 Claims

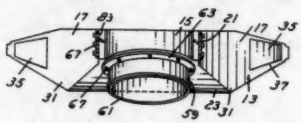


1. An explosion-proof, pollution-free infrared dryer for concentrated vaporization and removal of a combustible solvent from a newly coated product, comprising:
(a) a source of infrared radiation for vaporizing the combustible solvent from the product;
(b) a drying tunnel for surrounding and passing the product therethrough and having a radiation transmissive panel spaced from the source of infrared radiation and containing the combustible solvent vaporized by the infrared radiation applied through the panel and on to the product; and
(c) means producing a flow of combustion inhibiting atmosphere through the drying tunnel for mixing with the vaporized solvent to prevent ignition thereof and to carry the solvent from the drying tunnel away from the product and infrared source.

4,798,008
NOZZLE CONSTRUCTION

James A. Belanger; Robert J. Wentworth, both of Northville; Barry S. Turner, Livonia, and Graham J. Astley, Novi, all of Mich., assignors to Belanger, Inc., Northville, Mich.

Filed May 4, 1987, Ser. No. 45,356
Int. Cl.[4] F26B 19/00
U.S. Cl. 34—243 C 38 Claims

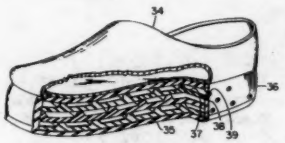


1. An air nozzle adapted for blowing water off a washed vehicle in a car wash comprising a unit nozzle housing of molded plastic material having a top wall, laterally diverging side walls, a substantially upright rear wall, an upper front wall portion inclined downwardly and outwardly of said rear wall, a lower front wall portion inclined downwardly and inwardly toward said rear wall, said walls and wall portions defining an air chamber of laterally increasing width from its top and with said side walls, said lower front wall portion and rear wall defining a laterally elongated throated air outlet, one of said upper front wall portion and rear wall having an air inlet opening therein, and an outwardly and laterally inclined downwardly converging hood upon each side wall communicating with said air chamber and terminating in an air outlet orifice for directing air laterally outward of said throated outlet and adapted for blowing water off the edges of a wider vehicle.

4,798,009
SPRING APPARATUS FOR SHOE SOLES AND THE LIKE

Richard C. Colonel, Box 2192, Renton, Wash. 98056, and Devere Lindh, 1910 Dogwood Dr. SE, Auburn, Wash. 98002

Continuation-in-part of Ser. No. 48,308, May 11, 1987, abandoned. This application Mar. 28, 1988, Ser. No. 174,035
Int. Cl.[4] A43B 13/18
U.S. Cl. 36—28 17 Claims

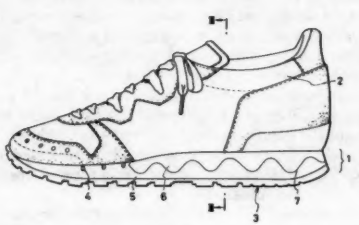


1. A spring for use in shoe soles and the like, said spring comprising at least first and second layers of resilient material, each of said first and second layers having a first smooth face and a second face having compression members formed on it, said compression members having spaces between them and tops, said first and second layers being adhesively attached with said tops on said first layer attached to said first side of said second layer with said compression members on said first layer positioned opposite said spaces on said second layer.

4,798,010
MIDSOLE FOR SPORTS SHOES

Yasunori Sugiyama, Hyogo, Japan, assignor to Asics Corporation, Japan

Continuation of Ser. No. 913,568, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 650,287, Sep. 12, 1984, abandoned. This application Apr. 4, 1988, Ser. No. 180,613
Claims priority, application Japan, Jan. 17, 1984, 59-6088
Int. Cl.[4] A43B 13/12, 13/18
U.S. Cl. 36—30 R 10 Claims



1. A sports shoe comprising:
(a) a shoe upper;
(b) an outsole; and
(c) a midsole comprising a soft elastic member and a hard elastic member having a greater hardness than that of the soft elastic member, the hard elastic member being disposed at one of a foot-contacting side of the midsole and a ground-contacting side of the midsole in a portion of at least lateral edge area of a heel portion of the midsole, the soft elastic member having an upper surface to which said shoe upper is joined, a lower surface to which said outsole is joined, and a joint surface joined to a joint surface of the hard elastic member and extending between the upper surface and the lower surface so as to face to one of the

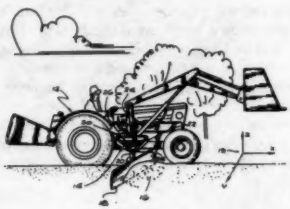
upper surface and the lower surface, the joint surface of the soft elastic member and the joint surface of the hard elastic member each having a complementary wavy configuration along a direction of longitudinal center axis line of the shoe for mollifying and reducing a strong reaction force produced by an impact to the shoe in a horizontal or oblique direction, the wavy configuration having at least two cycles of waves between a fore end of the heel portion and an aft end of the heel portion, the cycles of the waves having substantially the same wavelength and substantially the same amplitude.

4,798,011

VERSATILE TRACTOR SIDE BLADE MOUNT

Charles R. Sprinkle, 10580 Creek Rd., Ojai, Calif. 93023

Filed Dec. 3, 1987, Ser. No. 128,153
Int. Cl.[4] E02F *5/00*
U.S. Cl. 37—108 R **14 Claims**



1. A versatile tractor side blade mount system for use with a tractor comprising:

a control member including means for pivotally mounting said member on at least one side of said tractor;

a grading blade;

a blade holding bracket pivotally mounted on said control member;

joint member means for mounting said blade at an adjustably predetermined angle on said bracket;

means for rotating said blade holding bracket about its axis of rotation with respect to said control member;

means for rotating said control member about its axis of rotation with respect to the tractor;

the axis of rotation of said control member involving said means for pivotally mounting said control member being substantially parallel to the axis of rotation of said bracket with both of these axes extending in a predetermined direction, and said axes of rotation being spaced apart by a predetermined distance;

the distance between the axis of rotation of said bracket and said joint means being of the same order of magnitude as said predetermined distance; and

said control member having a significantly greater extent in the direction parallel to said predetermined direction than in the direction perpendicular to the plane defined by said two axes of rotation; and said bracket having a significantly greater extent in the direction parallel to said axes of rotation than in the direction perpendicular to the plane defined by the axis of rotation of said bracket and the point of securing said joint member means to said bracket;

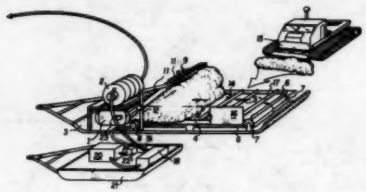
whereby said control member and said blade holding bracket may be rotated about their axes of rotation, and position said blade at a wide spectrum of angles, heights with respect to the tractor, and lateral distances from the body of the tractor.

4,798,012

PNEUMATIC PROCESS AND DEVICE FOR CONVEYING SNOW

Armand Pasquier, F-74000, Annecy, France, assignor to Etudes Techniques et Realisations (CdF Ingenierie) and Armand Pasquier, both of, France

Filed Apr. 8, 1987, Ser. No. 35,765
Claims priority, application France, Apr. 15, 1986, 86 05339
Int. Cl.[4] E01H *8/04*
U.S. Cl. 37—219 **19 Claims**



1. A device for conveying snow for snow application or snow removal, comprising:

conveying means for conveying a pile of snow;

first control means for controlling the rate of travel of the snow on said conveying means;

second control means for controlling the height of the snow on said conveying means;

a drawoff device for receiving the conveyed snow;

an injecting device operatively connected to said drawoff device for receiving the snow from said drawoff device and injecting the snow into conveying ducts, said injecting device and said drawoff device forming a stationary unit;

an air generator operatively connected to said injecting device for introducing air into said injecting device to produce a mixture of air and snow in said injecting device that is released into the conveying ducts;

means for driving each of said conveying means, injecting device, drawoff device and air generator.

4,798,013

HEADER SIGN MOUNTING ASSEMBLIES FOR PRODUCT MERCHANDISING DISPLAYS

Anthony Sainato, Glenview, Ill., assignor to Creative Products Merchandising, Elk Grove, Ill.

Filed Jul. 14, 1986, Ser. No. 886,090
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—651 **6 Claims**

1. A header sign mounting assembly for a product merchandising display wherein the display includes a generally vertical pegboard support panel and at least one shelf for arranging products thereon, said mounting assembly comprising:

(a) a header holder for holding a display sign; and

(b) means for mounting said header holder on the pegboard support panel, said mounting means comprising:

(i) a support bracket for supporting said header holder,
(ii) an upright brace for supporting said support bracket relative to the pegboard support panel, said upright brace having lower and upper ends,
(iii) an attachment bracket for detachably connecting said upright brace with said pegboard support panel,
(iv) first means for connecting said upright brace with said attachment bracket at the lower end of said upright brace, and
(v) second means for connecting said upright brace with said support bracket at the upper end of said upright brace;

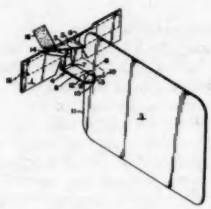
said attachment bracket comprising a pair of plates having leg portions adapted to be inserted into the pegboard support panel and then interengage therewith upon pivoting said plates into an overlapping relationship, said first connecting means comprising attachment means adapted to interfit with said plates and said lower end of said upright brace after said plates have been positioned in the overlapping relationship, engaging with said attachment means to secure said plates and said mounting assembly further including complementary means for said lower end of said upright brace together to maintain said leg portions of said plates interengaged with the pegboard support panel.

4,798,014

POINT-OF-PURCHASE DISPLAY

Charles A. Stoerzinger, Medford, and James Machlett, Holcombe, both of Wis., assignors to Tombstone Pizza Corporation, Medford, Wis.

Filed Feb. 13, 1987, Ser. No. 14,294
Int. Cl.[4] G09F 1/00
U.S. Cl. 40—124.1 **12 Claims**



1. A point-of-purchase display assembled from a single, folded piece of two-dimensionally rigid material comprising:
a. a vertical display member having a locking edge;
b. a vertical support member adapted to be secured on a vertical mounting surface; and
c. a tab comprising a slot and two fingers, said slot being cut between the two fingers, said slot and fingers being dimensioned such that, when assembled, said locking edge of said display member is positioned in said slot, with one of said fingers on either side of said display member.

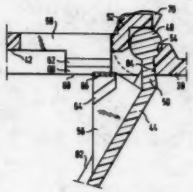
4,798,015

CONTAINER FOR A PILE OF PICTURES

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

PCT No. PCT/EP86/00622, § 371 Date Jun. 11, 1987, § 102(e) Date Jun. 11, 1987, PCT Pub. No. WO87/03105, PCT Pub. Date May 21, 1987
PCT Filed Oct. 29, 1986, Ser. No. 59,874
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1985, 3539339
Int. Cl.[4] G09F 1/12
U.S. Cl. 40—152.1 **18 Claims**

1. Container for a pile of substantially rectangular pictures of like format, having a housing with a viewing window and a slider member that can be pulled out of the housing, and a stand attached by a hinge to the housing base opposite the window, which stand has stop members which arrest the stand when it is folded out by coming up against complementary stop members on the housing, the stop members and the complementary stop members being arranged at a distance from the hinge of the stand in the direction towards the free end of the stand and the elements having the stop faces being designed and arranged in such a manner that as the stand is folded out they move apart with resilient deformation and when the stand is folded away they overlap one another.

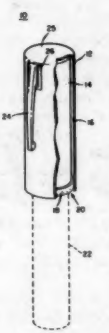


4,798,016

PICTURE PEN

Arthur P. Venditti, 2 Seneca Rd., Peabody, Mass. 01960, and William M. Martz, R.R. 2, Box 153A, West Point, Iowa 52656

Filed Apr. 3, 1986, Ser. No. 848,029
Int. Cl.[4] G09F 3/00
U.S. Cl. 40—334 **20 Claims**



1. An assembly for removably accommodating an image medium, comprising:
a generally cylindrical element;
a transparent sleeve removably disposable over said cylindrical element having an opening at a first end for receiving said element, and having an inner diameter slightly larger than the outer diameter of said element for defining a chamber to accommodate the image medium; and
means for removably securing said sleeve with said cylindrical element including means for frictionally engaging said cylindrical element and said transparent sleeve relative to each other, said means for frictionally engaging being disposed on said cylindrical element to engage said transparent sleeve proximate said first end when said sleeve is disposed over said cylindrical element.

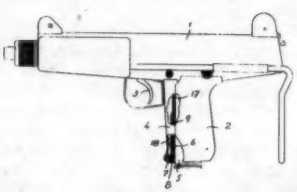
4,798,017
TRAFFIC DIRECTING SIGN
George A. Giotis, 124 Timberline Dr., Williamsville, N.Y. 14221
Filed Dec. 5, 1986, Ser. No. 938,383
Int. Cl.[4] G09F 7/02
U.S. Cl. 40—612 5 Claims

1. In a traffic directing sign device which includes in combination; a stabilizing base member having a post mounting means on the upper surface thereof, and a flat bottom surface whereby said sign device is adaptd to be set upon a highway surface in laterally slidable relation thereon; a post member detachably connected at its bottom end portion to said mounting means of said base member so as to extend vertically therefrom; and a traffic directing information carrying panel member formed of a flexible highly resilient normally flat sheet material detachably mounted along its vertical mid section upon said post member, whereby the opposite side portions of said panel are free to flex and allow wind gusts to slip around the post supported panel portion thereof while applying substantially reduced sign device toppling tending forces thereagainst; the improvement comprising:

said mounting means comprises a releasable clamping device; and

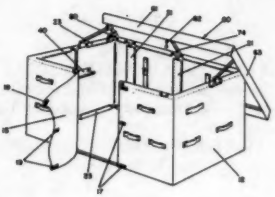
the opposite top and bottom end portions of said post member are similarly shaped and sectionally configured and dimensioned so that in event said post is broken off at its bottom end clamped connection to said base member the broken away part may be removed and said post member upended and readily reinserted into locked position within said clamping device.

4,798,018
MAGAZINE LOCKING MEANS FOR FIREARMS HAVING A MAGAZINE IN A PISTOL GRIP
Bertil Johansson, Brusensgatan 3B, S-633, 47 Eskilstuna, Sweden
Filed Sep. 3, 1987, Ser. No. 92,462
Claims priority, application Sweden, Sep. 5, 1986, 8603734
Int. Cl.[4] F41C 25/06
U.S. Cl. 42—7 9 Claims



1. Magazine locking means for firearms of the type having a pistol grip (2) or corresponding part which is grasped by the firing hand of a marksman and which includes a magazine guide (6) into which an exchangeable magazine (5) is introduced, and a magazine catch (9) mounted at the front side of the pistol grip (2) for movement between magazine locking and releasing positions, characterized in that said magazine catch (9) comprises a plate hingedly connected at its lower end to said pistol grip for pivotal movement between said locking and releasing positions and engageable in said locking position with a projecting part (17) at the front side of said magazine (5), said plate having grab parts (13 and 14) at the upper portion thereof projecting at opposite sides of said pistol grip (2), each of said grab parts (13 and 14) being usable independently of the other of said grab parts (13 and 14) to pivotally move said magazine catch (9) to said releasing position and release said magazine (5) from said magazine guide (6).

4,798,019
PORTABLE BLIND
Patty A. Sury, 5722 Second, NW., and James E. Wilkins, 171 Vineyard, NW., both of Albuquerque, N. Mex. 87107
Filed Feb. 9, 1988, Ser. No. 153,990
Int. Cl.[4] A01M 31/00
U.S. Cl. 43—1 18 Claims



1. A portable blind comprising:

a frame comprising a closed perimeter base, a matching perimeter top having an open portion therein, and a plurality of uprights disposed between said frame perimeter base and said frame perimeter top;

a fabric cover fittable on said frame, said frame and said cover forming a stable structure, said cover comprising a door portion positionable over said open portion of said perimeter top whereby user ingress into said blind and egress out of said blind is accomplishable through said door portion of said cover and said open portion of said frame perimeter top; and

a pair of cinching straps disposed on said fabric cover, one said strap being positioned on each side of and adjacent to said door portion of said fabric cover, said straps extending vertically essentially between said top and base frame perimeters when said cover is in place on said frame, said cinching straps being adjustably tightenable to provide additional stability to said blind.

4,798,020
SYSTEM FOR HARVESTING CRAWFISH
Albert L. George, P.O. Box 3604, Lafayette, La. 70502, and Don Gooch, 875 Hoyt Rd., Boyce, La. 71409
Filed Jan. 21, 1987, Ser. No. 5,590
Int. Cl.[4] A01K 81/04
U.S. Cl. 43—6.5 16 Claims

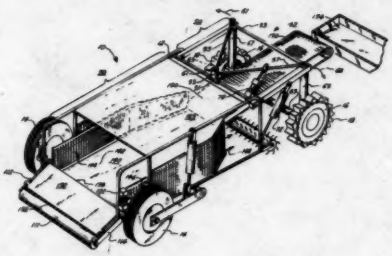
1. A vehicle for harvesting crawfish in their natural habitat, comprising:

a. a first primary frame portion;

b. means for advancing the frame portion forward through the water during harvesting;

c. a rigid primary roller extending a distance of at least the width of the vehicle, for dislodging crawfish from their habitat in the water as the vehicle advances through the water;

d. means for directing the travel of and receiving the dislodged crawfish onto a first portion of the vehicle; and



e. means for conveying the crawfish received to a primary collection zone.

4,798,021

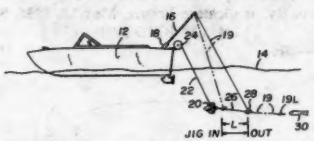
AUTOMATIC HORIZONTAL JIGGING DOWNRIGGER

Louis F. Miklos, Box 500, East Chicago, Ind. 46312

Filed Jun. 29, 1987, Ser. No. 68,119

Int. Cl.[4] A01K *91/00*

U.S. Cl. 43—19.2 **8 Claims**



1. An underwater horizontal jigging downrigger for being towed by a tow line from a fishing boat for use in trolling for fish with a fishing line having a lure comprising:

a streamlined housing having provision for being attached to a tow line for being towed behind a boat;

a propeller mounted to said housing for normally being turned as the housing is towed through the water;

a jigging line having a relase clamp for receiving a portion of a fishing line and holding that portion against normal forces encountered in trolling but releasing that line in response to higher forces such as result from a fish taking the line's lure;

a reel mounted on said housing for reeling in and allowing the reeling out of said jigging line;

means for coupling said reel to said propeller so that the propeller drives the reel so as to reel in said jigging line and for decoupling said reel from said propeller so that the reel may "freewheel" and allow said jigging line to be unreeled by the flow of water against that line and any fishing line and lure attached thereto; and

fins mounted on said housing and being so arranged in said housing that, as the downrigger is towed through the water, the fins bias the movement of the downrigger in one direction perpendicular to the direction of travel;

wherein said downrigger is provided with a plurality of tow line attaching means so that the user may select different orientation and determining the particular direction of perpendicular bias so that the towed downrigger may be made to be towed directly

behind or to the left or right of the boat; and wherein the housing defines a chamber which may be selectively filled with air or more massive material to change the buoyancy, mass and underwater movement characteristics of the downrigger.

4,798,022

COMBINATION FISHHOOK AND SWIVEL

Dean Rhoades, 9041 Olin St., Los Angeles, Calif. 90034

Filed Jun. 27, 1988, Ser. No. 211,882

Int. Cl.[4] A01K *91/04*

U.S. Cl. 43—44.83 **4 Claims**

1. An apparatus comprising:

a. a fishhook;

b. said fishhook further comprising an elongated stem portion having a straight end and which stem portion extends into at least one arcuate portion terminating in a pointed tip;

c. a swivel;

d. said swivel further comprising a sphere nonremovably, movably and rotatably retained within a basket and arm members extending from the basket and including aligned eyes therein; and

e. the sphere of said swivel attached to the straight end of said elongated stem portion of said fishhook;

f. whereby a fishing line can be threaded through said eyes and thereby attached directly to said swivel and to said fishhook.

4,798,023

METHOD OF CONTROLLING ENVIRONMENTAL CONDITIONS IN THE PROXIMITY OF VEGETATION OR CROPS WITH THE AID OF PROTECTIVE SHEETING, PROTECTIVE SHEETING FOR USE IN THIS METHOD, AND A PROTECTIVE DEVICE COMPRISING SHEETING

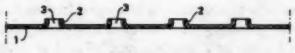
Gerhardus H. Morssinkhof, Klimmen; Lubbertus Vogel, Uden, and Adrianus Leenheer, Dordrecht, all of Netherlands, assignors to Stork Perforated Products B.V., Boxmeer, Netherlands

Filed Feb. 17, 1987, Ser. No. 15,330

Claims priority, application Netherlands, Feb. 14, 1986, 8600377

Int. Cl.[4] A01G *13/02*

U.S. Cl. 47—26 **18 Claims**



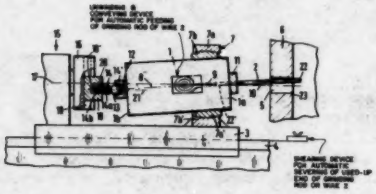
1. As an article of manufacture, a protective sheet for use in the cultivation of plants for controlling environmental conditions in the proximity of said vegetation or crops, said protective sheet being fabricated of flexible translucent plastic material, said protective sheet having opposite sides and being provided with a plurality of microperforations, each of said microperforations having flaired end portions connected by a constricted middle portion and defined by a protruded rim which is curved on its interior and exterior sides for dispersing light and guiding water on said sheet, and wherein the diameter of the smallest section of each microperforation at the constricted middle portion has a value of between 50 and 2000 μm and the number of microperforations per unit area is between 25 and 40000 per cm^2.

4,798,024

METHOD AND APPARATUS FOR DEBURRING THE INNER EDGE OF PART OF A WORKPIECE

Hans Grimm, Esslingen, Fed. Rep. of Germany, assignor to Maschinenfabrik Gehring Gesellshaft mit beschränkter Haftung & Co. Kommanditgesellschaft, Ostfildern, Fed. Rep. of Germany

Continuation of Ser. No. 742,296, Jun. 27, 1985, abandoned.
This application Jan. 14, 1987, Ser. No. 5,349
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424918
Int. Cl.[4] B24B 9/00
U.S. Cl. 51—33 R 7 Claims



1. A method of deburring specifically only an inner edge of a bore especially that of a small diameter transverse bore or the like of a workpiece in which burrs are rather inaccessible to be removed even with brush-like tools, including the steps of introducing a tool connected with a grinding spindle unit with a direct drive for a grinding spindle into said bore, and then moving said tool in said bore angularly over the burr which is to be removed from the inner edge of the bore without danger of such burr being brushed or moved into an interior of the transverse bore; said method comprising the steps of:

providing a grinder unit for holding said tool, unwinding said tool from a roll, and feeding said tool to said grinder unit;

rotating at least one of said tool that is a grinding rod which with the grinding spindle unit and drive embodied as a drive turbine and said workpiece operate collectively relative to each other at high speed in a predetermined range of revolutions per minute; and

imparting both a wobbling movement and also an axial travel movement to at least one of said tool and said workpiece whereby the drive turbine and grinder spindle form a structural unit which is mounted universally pivotable on all sides and driven via an eccentric drive and as a consequence of said wobbling movement after the tool has been introduced into the workpiece bore which is to be deburred, at least one of said tool and said workpiece furthermore describes a circular path which is concentric to the axis of the bore and the diameter of which increases progressively in a direction toward a free end of the bore when the grinding rod describes a configuration of a truncated cone as a consequence of said wobbling movement during effectiveness in angularly deburring specifically only the inner edge of the small diameter transverse bore therewith.

4,798,025

ABRASIVE DISC SUPPORT

Roger C. Lokken, and John B. Young, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

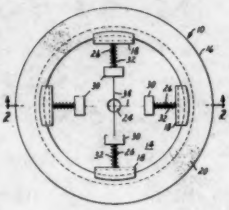
Filed Jun. 29, 1987, Ser. No. 67,047
Int. Cl.[4] B24D 9/08
U.S. Cl. 51—168 7 Claims

1. A disc support adapted to grip and support an annular abrasive disc comprising:

a frame including a flat base and an upstanding annular rim;

at least one disc retainer for forcing said disc into and retaining said disc in contact with said annular rim;

means for biasing said retainer toward said annular rim; and



a cable attached to and extending between said retainer and the diametrically opposite portion of said annular rim and wherein movement of said cable toward said base causes movement of said retainer away from said annular rim.

4,798,026

THERMOSTABLE ABRASIVE DIAMOND-CONTAINING PRODUCT

Jean-Michel Cerceau, Seyssinet, France, assignor to Societe Industrielle de Combustible Nucleaire, Annecy, France

Filed May 15, 1987, Ser. No. 50,027
Claims priority, application France, May 16, 1986, 86 07069
Int. Cl.[4] B24D 3/10
U.S. Cl. 51—204 15 Claims

1. Abrasive product comprising a compact essentially consisting of diamond particles presention an amount of more than 80% by volume of the compact, each particle being directly bonded to its neighbors so as to form a polycrystalline structure, and a binder phase filling the voids between said diamond particles, said binder phase essentially consisting of silicon, iron and nickel in alloyed condition, wherein the amounts of nickel and iron in said binder phase are in a ratio of from 5/95 to 70/30 by weight.

4,798,027

METHOD OF AND APPARATUS FOR SANDBLASTING WORKPIECE

Shuji Hamada, Yokohama, Japan, assignor to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,879
Int. Cl.[4] E06B 07/20
U.S. Cl. 51—310 16 Claims

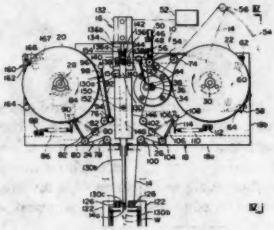
1. An apparatus for masking a surface portion of an object comprising:

a masking tape;

intermittent tape traveling means operable to cause said masking tape to travel by a prescribed length to index a portion of said masking tape in the vicinity of said object intermittently, said intermittent tape traveling means comprising a base, a feed reel rotatably mounted on said base and having said masking tape wound therearound, a take-up reel rotatably mounted on said base in spaced relation to said feed reel, and winding means for winding said

masking tape wound around said feed reel on said take-up reel; and

urging means operable to urge said portion of said masking tape into contact with said surface portion of said object to cover the same, said urging means including an urging rod having an urging member at one end thereof and disposed between said feed and take-up reels, and a drive cylinder including a piston rod having a foremost end and operably connected to the other end of said urging rod for moving said urging rod axially thereof to cause said urging member to urge said portion of said masking tape onto said portion of said object, said urging rod having a bore formed therein so as to extend axially thereof and opening



to an end face at said other end and a flange formed at said other end, said foremost end of said output shaft of said actuator being housed in said bore of said urging rod coaxially therewith for sliding movement longitudinally of said urging rod, a first spring disposed in said bore so as to act between said piston rod and said urging rod to urge said urging rod in a direction toward said object, stopper means fixedly secured on said base so as to be disposed intermediate said ends of said urging rod, and a second spring disposed around said urging rod so as to act between said flange portion of said urging rod and said stopper means to urge said urging rod in a direction away from said object.

4,798,028

DOWNSPOUT TRAP AND CLEAN OUT

John A. Pinion, 1529 Oakdale NW., Warren, Ohio 44485

Filed Nov. 30, 1987, Ser. No. 126,423
Int. Cl.[4] E04D *13/08*
U.S. Cl. 52—16 **5 Claims**

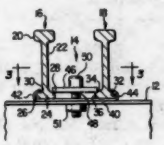
1. In gutter and downpout drainage apparatus of the type communicating with a drain line; an improved downspout trap and clean out apparatus, the improvement comprising; a vertically disposed integral tubular body member formed in upper and lower portions of different lengths and different diameters, screen means in said lower portion, said upper portion being of a known diameter and length sufficient to telescopically engage over a lower end of said downspout in first and second positions and said lower portion being of a known diameter and length capable of being telescopically engaged in an upper end of said drain line in said first position, whereby said tubular body member may be moved vertically to said second position where said lower portion is free of said drain line so as to permit the tubular body member to be removed from said downspout.

4,798,029

HOLD-DOWN CLAMP

Donald G. Carlton, Denton, Tex., assignor to Fibergrate Corporation, Dallas, Tex.

Filed Nov. 30, 1987, Ser. No. 126,882
Int. Cl.[4] B44D *5/08*
U.S. Cl. 52—177 **5 Claims**



1. A clamp for clamping a grate to a structural member is provided, the grate having parallel beams with a I-beam cross section, comprising:

a restraining clip extending between a pair of adjacent beams and about the outer portion of the base of each beam;

a hold-down clamp extending between the pair of adjacent beams proximate the restraining clip and contacting the inner portion of the base of each beam;

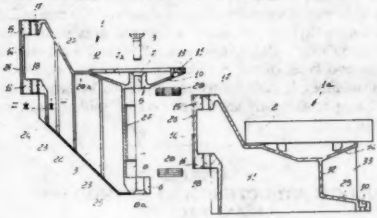
fastening means for fastening the grate to the structural member by urging the hold-down clamp toward the structural member, and thereby urging the bases of the pair of beams against the structural member, the restraining clip preventing separation of the pair of beams.

4,798,030

MODULAR SUPPORT FOR STAIRCASE STEPS

Roberto Molinazzi, Bologna, Italy, assignor to Indexstudio S.a.s. di Molinazzi Roberto & C., San Lazzaro Di Savena Bo, Italy

Filed May 14, 1987, Ser. No. 49,362
Claims priority, application Italy, Oct. 16, 1986, 3542 A/86
Int. Cl.[4] E04F *11/02*
U.S. Cl. 52—188 **3 Claims**



1. Modular support for staircase steps, comprising a box-like body,

a female cylindrical portion provided at one end of said box-like body and defining a concavity facing outwards with respect to said body,

a male cylindrical element provided at the opposite end of said body at a higher level with respect to said female portion,

said female portion and said male element being vertically parallel to each other,

a first headpiece projecting from the upper end of said female portion and provided with means for mounting a step thereon,

a second headpiece projecting from the lower end of said female portion,

vertical tooth means projecting outwards from said male element and inwards from said female portion, the tooth means of the male element being complementary to the tooth means of the female portion,

screw means being further provided traversing said headpieces and adapted to engage a male cylindrical element of an adjacent support inserted into said concavity between said headpieces to retain the tooth means of said element in engagement relationship with the tooth means of said female cylindrical portion.

4,798,031

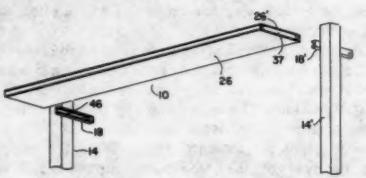
DOUBLE POLE SPANNER DISPLAY

Gary P. George, St. Louis, Mo., assignor to Stout Industries, Inc., St. Louis, Mo.

Filed Nov. 2, 1987, Ser. No. 115,990

Int. Cl.[4] E04C *1/00*

U.S. Cl. 52—309.11 **7 Claims**



1. For use in a wind-resistant elongated spanner, a display member for being supported longitudinally in display configuration, the display member comprising a thin beam configuration core of expanded polystrene presenting parallel, rectangular front and rear faces having a high aspect ratio, channel configuration top and bottom rails extending along top and bottom core faces, face panels of aluminum sheet material extending over the front and rear core faces, and layers of mist-activated laminating adhesive interposed between the face panels and respective front and rear core faces for securement of the face panels to the core, said laminating adhesive prior to application being a water-insoluble, thin liquid urethane propolymer solution having 78% non-volatiles, a vapor density greater than air, a boiling point of 104° F., based on methylene chloride), a vapor pressure of approximately 380 mm at 22° C., (based on methylene chloride), a specific gravity of 1.15, an evaporation rate (nBUOAc=1) of unity, and a solvent odor, opposite end faces of the core being uncovered, whereby the display member is sufficiently strong as to be wind-resistant when its opposite ends are supported by said upright structures.

4,798,032

DOMICAL STRUCTURE AND METHOD FOR ITS MANUFACTURE

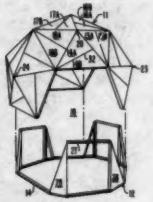
Benjamin L. Rose, Jr., Richmond, Va., assignor to American Geodesics, Inc., Richmond, Va.

Filed Feb. 22, 1988, Ser. No. 158,709

Int. Cl.[4] E04B *1/32*

U.S. Cl. 52—81 **8 Claims**

1. A domical structure made principally from a multiplicity of substantially flat triangular sections coming together at edges comprising: first and second substantially flat triangular subsections joined together along a dividing line to form each of said triangular sections with said dividing line running from an apex of said triangular section to an opposite divided side thereof; each of said first and second triangular subsections having a first and longer side forming one side of said triangular section, a second side of intermediate length which is the same length in both subsections and define the side where the



two subsections are joined together and a third and shorter side which forms part of said third divided side of the triangular section; and said sections third divided side arranged in the structure so that no dividing line throughout the entire structure is positioned to be aligned with another dividing line of an adjacent section at an edge between the adjacent sections.

4,798,033

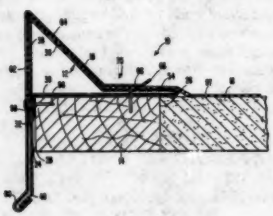
ROOF EDGE ASSEMBLY

David Weidl, Columbus, Ohio, assignor to F. O. Schoedinger, Inc., Columbus, Ohio

Filed Jul. 2, 1987, Ser. No. 69,166

Int. Cl.[4] E04D *13/00*

U.S. Cl. 52—94 **43 Claims**



17. For a horizontal or gently sloping roof having a roof edge, a raised roof edge assembly comprising: a nailer structure secured to the roof edge, the nailer structure having a nailer forward edge, a nailer upper surface, a nailer rear edge, and a nailer bottom edge; and a single-ply membrane positioned generally above the nailer structure, wherein the improvement comprises:

a water dam,

said water dam including a lower horizontal dam portion extending inwardly from the nailer forward edge and having a forward end and a rear end, a tab portion extending from said forward end of said lower horizontal dam portion and extending downwardly generally along the nailer front surface, an upper horizontal dam portion extending from said rear end of said lower horizontal dam portion and outwardly towards the nailer forward edge, a sloping dam portion extending upwardly and outwardly from said upper horizontal dam portion and extending above the nailer upper surface and towards the plane of the nailer front surface, and a generally vertical dam portion extending downwardly from said sloping dam portion and outside of said tab portion, and extending downwardly past the nailer upper surface and generally along the nailer front surface; and

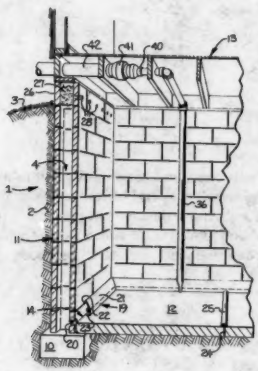
a mechanical fastener fastening the single-ply membrane directly to said vertical dam portion.

4,798,034

METHOD AND APPARATUS FOR COLLECTING AND DISCHARGING RADON GAS AND FLUIDS

Jerry D. Jarnagin, and Dennis W. Dawson, both of Canton, Ill., assignors to Safe Aire, Inc., Canton, Ill.

Filed Jan. 14, 1987, Ser. No. 3,138
Int. Cl.[4] E02D *19/00*
U.S. Cl. 52—169.5 **20 Claims**



1. Apparatus for collecting gas and fluids from the periphery of a subterranean enclosure having walls and a floor defining a junction region therebetween and for discharging the collected gas and fluids outside the enclosure, the apparatus comprising:

(a) collecting means disposed within the enclosure for collecting gas and fluids from predetermined zones outside the enclosure, said means being impervious to gas and fluids and defining a plurality of conduits in communication with said predetermined zones outside the enclosure, said means being generally disposed at the junction region;

(b) means for creating a lower than ambient air pressure in said collecting means so that gas and fluids have a tendency to flow from the predetermined zones outside the enclosure through the conduits and into the collecting means, and for venting the gas outside the enclosure; and

(c) means for draining the collected fluid from the collecting means and for disposing of the fluid.

4,798,035

FLOOR-TO-CEILING WALL SYSTEM

Terry L. Mitchell, Jenison, and Lawrence J. Spoolstra, Byron Center, both of Mich., assignors to Architectural Wall Systems, Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 869,439, Jun. 2, 1986, Pat. No. 4,709,517. This application Oct. 14, 1986, Ser. No. 918,540
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—281 **27 Claims**

1. A floor-to-ceiling portion system comprising:

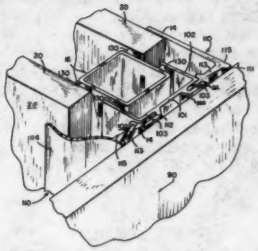
a partition for placement in proximity to an existing wall;

a rigid channel for mounting on an existing wall and including spaced rigid sidewalls engaging the opposite sides of said partition at the end thereof and a base wall joining said channel sidewalls;

a pair of flexible cover members, said rigid channel and said cover members including cooperating mounting means whereby one of said flexible cover members is mounted to cover each of the opposite sidewalls of said rigid channel;

said mounting means includes a slot at each side of said rigid channel being defined by a pair of back walls, jutting rearwardly from said base wall and then extending in a direction generally parallel to said base wall, and in opposite directions to one another, to thereby define at each side of said rigid channel a slot between each of said back walls and said base wall, and a prong flange on said flexible cover extending in one direction which is frictionally fitted into said slot; and

each of said cover members including an elongated flexible



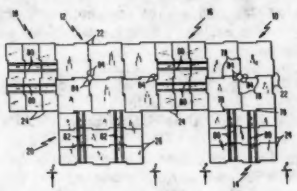
cover flap, which is longer than each of said sidewalls of said rigid channel, whereby said flexible cover flap extends outwardly past the end of said partition and into engagement with a side of said partition to present to the viewer a generally flush, continuous appearance at the end of said partition in the vicinity of said pre-existing wall; said flexible cover flap having a resiliency which permits said cover flap to be resiliently pulled outward a significant amount so that access may be had to the covered end of said partition.

4,798,036

CONCRETE MASONRY FOOTER BLOCK FOUNDATION SYSTEM AND BLOCKS THEREFOR

Jorge Pardo, Reston, Va., assignor to National Concrete Masonry Association, Herndon, Va.

Continuation of Ser. No. 771,607, Sep. 3, 1985, abandoned. This application Jul. 8, 1987, Ser. No. 71,021
The portion of the term of this patent subsequent to Nov. 3, 2004, has been disclaimed.
Int. Cl.[4] E02D *27/32*
U.S. Cl. 52—293 **16 Claims**



1. A footing system for a structure, said structure being a wall resting upon and extending upwardly from the footing system comprising:

a footing including a plurality of footing blocks disposed in abutting relationship along a footing axis substantially parallel to the structure to be supported on said footing and so that said footing functions as a foundation system for the structure;

said footing blocks having protrusions and depressions in abutting sides thereof to provide a lateral interlocking and alignment between adjacent footing blocks;

said footing blocks having a lateral dimensions substantially perpendicular to said footing axis and longitudinal dimensions along said footing axis wherein said lateral dimensions are substantially larger than said longitudinal dimensions;

whereby said wall is supported on said abutting footing blocks and wherein said wall has a width dimension along said footing axis which is significantly less than the corresponding lateral dimension of said footing blocks, the wide lateral dimension of said footing blocks enabling the footing system to cope with the poor soil conditions while at the same time keeping the weight of the individual footing blocks relatively low to permit efficient manual handling, said footing blocks further enabling the footing to conform to uneveness of the substrate foundation by virtue of the ability of the footing blocks of relatively short longitudinal extent relative to their lateral extent to settle into firm supporting engagement with the substrate, thereby minimizing stresses within the footing which might otherwise result in breakage of the footing and weakening of the wall.

4,798,037

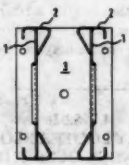
STEEL SOLDIER

John Collins, Nr. St. Albans, England, assignor to Mabey Hire Co., Limited, Reading, England

Continuation of Ser. No. 712,982, Mar. 18, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 29,369

Int. Cl.[4] E04G *17/14*; E04C *3/09*

U.S. Cl. 52—731 **6 Claims**



1. A soldier comprising a pair of beam elements connected in substantially laterally spaced, opposite parallel relation by a tie plate at each end, wherein each beam element has an elongated web with opposite longitudinal edge extensions which enter within and are supportively attached to separately formed, asymmetrical, hollow profile chord plates, each chord plate, in conjunction with one face of each extension, defining a closed space of substantially triangular cross-section having a substantially right angle at the juncture of the edge of said extension and said chord plate and, on the opposite side of each extension, terminating in a flange which is spaced from and parallel to said extension.

4,798,038

CONTINUOUS BAND AND TRIM SEALING APPARATUS FOR POLY BAGS

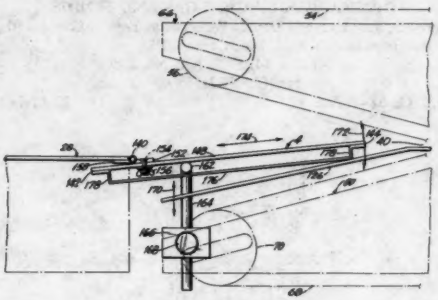
Irving L. Litt, Rockville Centre, N.Y., assignor to All Packaging Machinery & Supplies Corp., Ronkonkoma, N.Y.

Filed Feb. 4, 1988, Ser. No. 152,704

Int. Cl.[4] B65B *7/06, 51/18*

U.S. Cl. 53—372 **10 Claims**

7. An adjustable leveling platform for installation in a conveyorized band/trim sealing apparatus of the kind in which open top portions of conveyed product-filled bags remain supported on an upstream side wing of the apparatus until they are transported over a three-dimensional gap to a ramp-like entrance guide plate of a downstream band sealing and trimming machine of the apparatus, said platform comprising a rigid, planar, elongated rectangular member having a width substantially matching that of said side wing and a length substantially matching the distance between the downstream end of said side wing and the entrance of said band sealing and trimming machine, said platform being provided with two identical slots therethrough which run in parallel adjacency to respective ones of its longitudinal sides and which are adapted to receive fasteners for releasably connecting said platform to



one element of a two-element hinge whose other element is to be fixed to said downstream end of said side wing, thereby to allow slot-guided sliding adjustments to be made in the effective extension of said platform from said side wing and to allow the pitch attitude of said platform extension about said hinge to be varied.

4,798,039

PROCESS AND APPARATUS FOR FILLING CONTAINERS UNDER VACUUM

René Deglise, Pully, Switzerland, assignor to Ipatec S.A., Pully, Switzerland

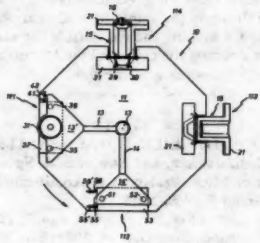
PCT No. PCT/FR86/00422, § 371 Date Aug. 3, 1987, § 102(e) Date Aug. 3, 1987, PCT Pub. No. WO87/03555, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 5, 1986, Ser. No. 96,020

Claims priority, application Switzerland, Dec. 5, 1985, 5181/85

Int. Cl.[4] B65B *31/06, 1/32, 3/28*

U.S. Cl. 53—432 **27 Claims**



1. In an apparatus for vacuum filling containers with pulverulent or granular materials, including weighing means for weighing the materials, conveying means for conveying pulverulent or granular materials to said weighing means, dispensing means for dispensing weighed materials from the weighing means to containers, vacuum means for applying vacuum to the containers containing the materials, and sealing means for sealing the vacuum filled containers; wherein the improvement

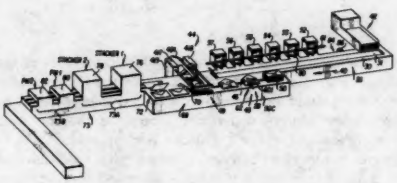
comprises a turntable mounted for intermittent rotational movement relative to all the aforesaid means, said turntable having at its periphery a plurality of at least three support means for receiving respective ones of the containers, said support means being uniformly angularly spaced from one another, said conveying means, weighing means, dispensing means, vacuum means and sealing means being each arranged at one of two fixed stations proximate to the periphery of said turntable, said fixed stations having the same angular spacing between each other as the angular spacing between angularly adjacent ones of said support means.

4,798,040

INSERTION MACHINE

Dave Haas, Schaumburg; Gary VanderSyde, Naperville; Paul Beatty, and Ren Roxas, both of Chicago, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Mar. 25, 1987, Ser. No. 30,015
Int. Cl.[4] B65B *5/04, 25/14, 5/14*
U.S. Cl. 53—460 **7 Claims**



1. A method of operating an insertion machine, said method comprising the steps of:

transporting at least one item to an insertion station;

transporting an envelope to an envelope opening station proximate said insertion station;

orienting shoving means so that said shoving means is in a first orientation whereat said shoving means is usable for inserting an item into an envelope;

reciprocating said shoving means along a path toward and away from said envelope opening station in a manner whereby said shoving means in said first orientation is in the path of said item and shoves the item at said insertion station into an envelope held open in said envelope opening station;

extending an entry finger into said envelope so that said item being shoved by said shoving means is on a first side of said entry finger;

permitting said entry finger to move in a direction away from said item when said item contacts said first side of said entry finger;

sensing when said entry finger extended into said envelope is moved a predetermined distance indicative of a jam; and,

orienting said shoving means, in response to said sensed jam, in a second orientation whereat said shoving means is out of the path of said item and inoperative for inserting an item into an envelope.

4,798,041

LINK BAG AND OPENING FIXTURE

Per Bentsen, Suffern, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

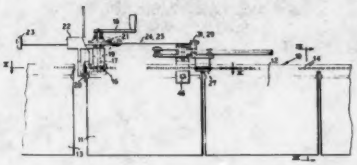
Filed Feb. 6, 1987, Ser. No. 11,926
Int. Cl.[4] B65B *43/12*
U.S. Cl. 53—468 **14 Claims**

1. An apparatus for processing a bag chain to fill individual reclosable bags with spaced sprocket openings along the top, comprising in combination:

an advancing sprocket wheel rotatable about a vertical axis and having peripheral teeth for engaging with correspondingly spaced sprocket holes along the top edge of a bag chain for vertically supporting the chain and for advancing the chain along a path;

first drive means for driving the wheel intermittently to advance the bag chain while continuing the vertical support;

spreader members engageable with opposed top edges of individual bags of said chain and being laterally relatively spreadable relative to said path for opening the top edges of a bag and again closable to release the top edges, said



spreader members each having idler sprocket wheels with peripheral teeth for engaging with the sprocket holes along the top edge of the bag for supporting the bag at a location spaced from said advancing sprocket wheel;

second drive means operating the spreader members;

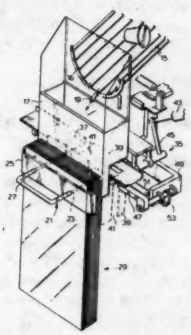
and a closer having pressing elements applying a lateral force to the bag top for interengaging rib and groove elements on the bag to close the bag with the closer located in a position after said spreader members along said path.

4,798,042

ARTICLE BAGGER

Robert Davis, 7305 Woodbine Avenue, Unit #519, Markham, Ontario, Canada L3R 3V7

Filed Nov. 5, 1987, Ser. No. 116,898
Int. Cl.[4] B65B *43/36, 43/44, 43/62, 39/02*
U.S. Cl. 53—572 **5 Claims**



1. A bagging machine comprising a bag support supporting a plurality of open topped bags stacked upright against one another, a bag opener for initiating opening of the bags individually at said bag support, a pair of flaps movable between an up and a down position, said flaps when in the down position fitting interiorly of and stretching the opening of the bags, feed means vertically feeding the articles to the stretched opened bags with said flaps providing both an article feed guide and sole support for the bags while being fed with such articles, a bag puller at one of said flaps only, bag puller control means for fitting said bag puller to a gripping position interiorly of the bags with said flaps in said down position, flap control means

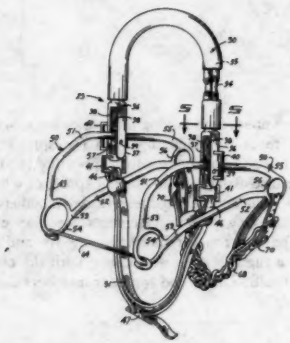
to move said flaps to the up position as said bag puller control means operates said bag puller to pull said bags sideways off of said bagging machine.

4,798,043

MECHANICAL HACKAMORE

Patrick E. Wyse, P.O. Box 695, Conrad, Mont. 59425

Filed Aug. 21, 1987, Ser. No. 88,136
Int. Cl.[4] B68B *1/04*
U.S. Cl. 54—6 R 10 Claims



10. A mechanical hackamore adapted to fit over the muzzle of an animal such as a horse, comprising:

a nose band extending between ends and adapted to be received over a horse's nose bridge with the nose band ends being situated adjacent the cheek regions on opposite sides of the nose bridge;

a stabilizer strap operably connected to the nose band and adapted to be received under the chin region of the horse's head, thereby forming a loop with the nose band for transversely encircling the nose bridge, cheek and chin area of the horse;

a pair of elongated leverage frame means each forming an open framework with spaced bottom and top members extending between frame ends and mounted at pivots situated adjacent the ends of the nose band for pivotal movement in relation to the nose band and stabilizer strap and for substantially flush engagement with cheek surfaces on opposite sides of the horse's face;

wherein the leverage frame means extend from the pivots forwardly to forward frame ends adapted to mount reins, and rearwardly from the pivots to rearward frame ends;

wherein the pivots are situated substantially midway along the lengths of the frame means between the forward and rearward frame ends;

curb strap mounting means on each leverage frame means adjacent the rearward frame end thereof;

a curb strap extending between the curb strap mounting means of the leverage frame means, and adapted to be received under the horse's chin for movement toward and away from the horse's chin responsive to pivotal movement of the frame means; and

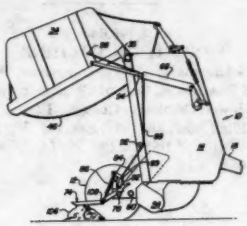
forward stabilizer means extending between the pair of leverage frame means adjacent the forward frame ends for transmitting lateral forces applied through reins to the leverage frame means on opposite sides of the horse's face so that one of the frame means will press against a side of the horse's face in the direction of a desired turn.

4,798,044

MACHINE FOR FORMING CYLINDRICAL BALES OF CROP

Jean Viaud, Sarraguemines, and Daniel Gunther, Morsbach, both of France, assignors to Deere & Company, Moline, Ill.

Filed Aug. 25, 1987, Ser. No. 89,282
Claims priority, application United Kingdom, Aug. 28, 1986, 8620799
Int. Cl.[4] A01F *15/00*; B30B *5/06*
U.S. Cl. 56—341 9 Claims



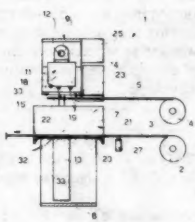
1. In a baling machine for forming cylindrical bales of crop including a bale chamber defined in part by a bale discharge gate pivotable about an upper front location thereof between a lowered closed position wherein it closes the chamber and a raised open position wherein it allows a completed bale to exit the chamber, a support extending beneath the bale discharge gate and being vertically pivotally mounted for movement between an elevated non-discharge position and a lowered discharge position wherein it forms a ramp for the bale to roll down, the improvement comprising: suspension means coupled between the support and the discharge gate and responsive to the discharge gate opening, only after the gate has opened a predetermined amount sufficient for permitting a bale to exit the chamber without fouling the gate, for lowering the support to its discharge position.

4,798,045

PROCESS FOR SPLICING FIBERS IN STRIPS, AND A MACHINE FOR FEEDING A TEXTILE MACHINE INCORPORATING SUCH A PROCESS

Teresio Bottarelli, 13096 Vigliano Biellese, Regione Barazzetto, 24, Italy, and Antonio Nulchis, 13014 Cossato, Viale Paietta, 5b, Italy

Filed Oct. 7, 1987, Ser. No. 105,531
Int. Cl.[4] B65H *69/06*; D01H *15/00*
U.S. Cl. 57—22 15 Claims



1. A machine (1) for feeding the drawing frame on a textile machine with a number of fiber strips (3); characterized by the fact that it comprises at least a first member (2) for collecting a supply strip (3); at least a second member (4) for collecting a standby strip (5); a channel (7) inside which said supply strip (3) runs and over which is suspended the initial portion (22) of

said standby strip (5); releasable means (23) for supporting said portion of said standby strip (5); a sensor (27) for detecting the continuity of said supply strip (3) and located upstream from the inlet on said channel (7); an air-powered device (18) for splicing the overlapping fibers of said supply and said standby strips (3, 5); and a vertically-moving gripping device (9) supporting said means (23) supporting said standby strip, and said air-powered splicing device (18); said gripping device (9) being designed to move down inside said channel (7), so as to place said initial portion (22) of said standby strip (5) over the end (40) of said supply strip (3) portion located immediately downstream from said sensor (27), and to grip said strips between the bottom wall (20) of said channel (7) and the base (14) of said gripping device (9) itself.

4,798,046

OPENING CYLINDER FOR OPEN-END SPINNING MACHINES

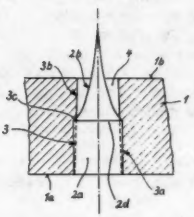
Jörg Stauffer, Eigenrain 6, CH-4107 Ettingen, and Hans Riethmann, Jr., Breitestrasse 28, CH-8614 Bertschikon, both of Switzerland

Filed Jul. 7, 1986, Ser. No. 882,681

Claims priority, application Switzerland, Jul. 6, 1985, 02922/85

Int. Cl.[4] D01H *7/895*; D01G *9/14, 15/20, 15/26*

U.S. Cl. 57—408 **12 Claims**



1. An opening cylinder for open-end spinning machines, which comprises a cylindrical ring (1) serving as a needle support for needles and needle-carrying bores (3) which extend from an inner ring surface (1*a*) to an outer ring surface (1*b*), each of said needles comprising a point section (2*b*) of generally tapered shape and a shaft section (2*a*), said bores comprising an inner section (3*a*) receiving at least partially said shaft section of the corresponding needle with force fit and an outer section (3*b*) surrounding a portion (2*b'*) of said point section (2*b*) of the corresponding needle, said inner section (3*a*) of the bore having at least partially a diameter which is greater than the diameter of the outer section (3*b*) of the bore in the range of its orifice in the outer ring surface (1*b*), said outer section (3*b*) of the bore surrounding said portion (2*b'*) of said needle point section (2*b*) at a distance so as to form an annular groove (4) therewith.

4,798,047

PARTICULATE COLLECTION AND COOLING IN A TURBOMACHINE

Carl H. Geary, Greensburg, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Dec. 19, 1983, Ser. No. 562,614

Int. Cl.[4] F02G *3/00*

U.S. Cl. 60—39.092 **14 Claims**

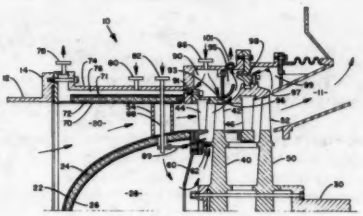
1. A power recovery expander for use with a stream of hot gas with entrained particulates which comprises:

a rotor including a first stage of blades mounted in the stream of hot gas;

an annular collection means defining a receiving chamber located downstream and radially outward of the first stage of blades including an inlet positioned to receive particulates directed outwardly by the blades;

a series of first stator blades located upstream from the first stage of blades;

means for cooling the first stator blades including means defining a cooling chamber in heat exchange relationship



with the first stator blades, said cooling chamber being connected to receive a cooling gas; and

outlet means defining a passageway extending from the cooling chamber to the receiving chamber to direct at least a portion of the flow of cooling gas into the receiving chamber whereby said portion of the flow of cooling gas acts to assist in displacing the particulates into the receiving chamber.

4,798,048

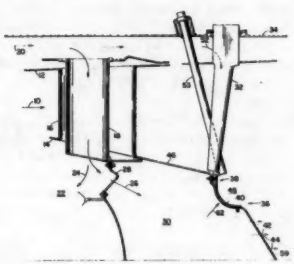
AUGMENTOR PILOT

Thomas R. Clements, Palm City, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1987, Ser. No. 135,773

Int. Cl.[4] F02K *3/10*

U.S. Cl. 60—261 **9 Claims**



1. In an afterburning gas turbine engine an augmentor duct arrangement comprising:

a duct confining gas flow;

a truncated diffuser tail cone located centrally within said

duct, and having an axial surface and a downstream facing surface;

a step change with respect to said axial surface at the outer periphery of said downstream facing surface forming a recirculating gas zone immediately downstream of said step change;

a plurality of radial spray bars extending from said duct to the downstream end of said tail cone;

each spray bar including a cooling air flow passage and a fuel flow passage; and

said fuel flow passage having a plurality of augmentor fuel injectors, and a pilot injector directing fuel into said recirculation zone.

4,798,049

INTERNAL COMBUSTION ENGINE WITH PRESSURE-WAVE SUPERCHARGER AND LAMBDA PROBE

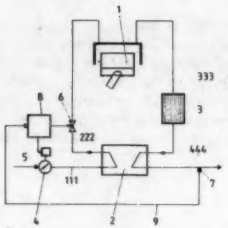
Andreas Mayer, Niederrohrdorf, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Jul. 2, 1987, Ser. No. 69,485

Claims priority, application Switzerland, Jul. 8, 1986, 2749/86

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—276 **6 Claims**



1. A circuit of an internal combustion engine supercharged by a pressure-wave supercharger, comprising an engine, a pressure-wave supercharger having a low-pressure exhaust gas line, and exhaust gas particle filter, a throttle valve and a starting valve, wherein a Lambda probe is fitted in the low-pressure exhaust gas line, the measuring signal of which probe acts via a computer unit on the throttle valve.

4,798,050

CONTROL SYSTEM FOR HYDRAULIC TANDEM PUMP IN MOTOR VEHICLE

Keiichi Nakamura; Tsuneo Tanaka; Yoshiharu Inaguma, all of Kariya, and Harunori Shiratori, Toyota, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 11, 1987, Ser. No. 60,525

Claims priority, application Japan, Jun. 11, 1986, 61-88897[U]

Int. Cl.[4] F16D *31/00*

U.S. Cl. 60—329 **3 Claims**

1. A control system for a hydraulic tandem pump assembly adapted for use in a motor vehicle, said tandem pump assembly including a primary pump for supplying fluid under pressure to a power-assisted steering device and a secondary pump for supplying fluid under pressure to a hydraulic motor of an engine cooling fan, which pumps are mounted on a common drive shaft for rotation therewith,

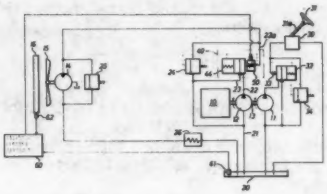
wherein the control system comprises:

an electrically operated flow quantity control valve disposed within a communication passage between said secondary pump and said hydraulic motor to bypass fluid under pressure discharged from said secondary pump into an inlet passage connecting a fluid reservoir to said secondary pump;

a first temperature sensor arranged to detect the temperature of hydraulic fluid stored in said fluid reservoir for producing therefrom an output signal indicative of the fluid temperature;

a second temperature sensor arranged to detect the temperature of cooling water flowing through a radiator of a prime engine of the vehicle for producing therefrom an output signal indicative of the cooling water temperature; and

an electric control apparatus connected to said first and second temperature sensors to control an electric current



applied to said flow quantity control valve in dependence upon values of the output signals from said temperature sensors in such a manner that said flow quantity control valve is conditioned to bypass a large part or the entirety of fluid under pressure discharged from said secondary pump into said inlet passage when the fluid temperature and the cooling water temperature are respectively below a predetermined value and conditioned to decrease the bypass flow quantity of fluid in accordance with rise of the fluid temperature and cooling water temperature higher than the predetermined value.

4,798,051

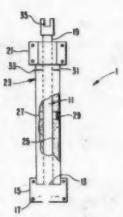
ROTARY ACTUATOR WITH TAILORED TORQUE OUTPUT

Eugene B. Foote, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 20, 1988, Ser. No. 208,531

Int. Cl.[4] F03G *7/06*

U.S. Cl. 60—527 **11 Claims**



1. An apparatus for delivering torque through a selected angle of rotation, comprising:

a torsion member having a longitudinal axis and being made from a shape memory alloy, said member having a zero degree rotation about said longitudinal axis when said member is heated to a temperature above a predetermined temperature and having a predetermined angular rotation about said longitudinal axis when said member is at a temperature below said predetermined temperature; and

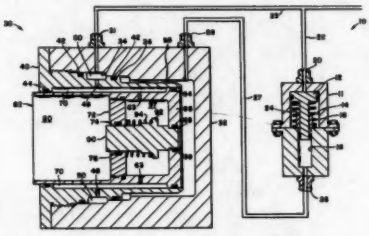
heat generating material surrounding said torsion member to selectively heat successive portions of said member to a temperature above said predetermined temperature to cause said member to rotate about said longitudinal axis in a predetermined fashion.

4,798,052

CONSTANT-CLEARANCE BRAKE PISTON SYSTEM WITH BRAKING PRESSURE INTENSIFIER

David D. McAfee, South Bend, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed May 8, 1987, Ser. No. 47,952
Int. Cl.[4] F15B 7/10; F16D 55/02
U.S. Cl. 60—572 **9 Claims**



1. A hydraulic brake adjuster and piston assembly, comprising a piston housing having therein a cavity with a cavity surface, a piston bushing disposed in the cavity and defining substantially with the cavity surface a pair of longitudinal pressure chambers, a piston with a recessed outer surface received in the piston bushing and defining therebetween an axial pressure chamber which communicates with one of the longitudinal pressure chambers, the piston having a substantially closed interior chamber with a piston valve disposed therein and extending through a rear opening in a rear wall of said piston, the piston rear wall defining with the bushing a portion of the other longitudinal pressure chamber, the substantially closed interior chamber communicating by means of an opening with the axial pressure chamber and the interior chamber normally isolated from the other longitudinal pressure chamber, the rear opening of the piston and the piston valve communicating with the other of the pair of longitudinal pressure chambers, and an exterior pressure device disposed separate from the piston and communicating with the other longitudinal pressure chamber, actuation pressure being communicated to the one longitudinal pressure chamber and exterior pressure device so that the exterior pressure device communicates a fluid pressure output to the other longitudinal pressure chamber.

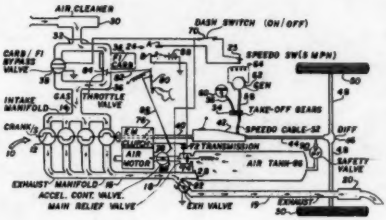
4,798,053

KINETIC ENERGY RECLAIMING SYSTEM FOR VEHICLE

Jimmy C. K. Chang, 215 Powell St., San Francisco, Calif. 94102

Continuation-in-part of Ser. No. 940,092, Dec. 10, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,510
Int. Cl.[4] F01B 29/04; B60K 3/00
U.S. Cl. 60—712 **20 Claims**

1. A vehicle energy recovery system, comprising:
a vehicle having an engine which can convert a source of fuel to mechanical energy to drive said vehicle and which can compress a gas supplied to said engine if said engine is turned by the kinetic energy of said vehicle when said vehicle is coasting, said engine having an output pipe for conducting exhaust gas from said engine when it runs on said fuel and for conducting said compressed gas from said engine when it is turned by the kinetic energy of said vehicle,
a transmission arranged to connect a mechanical output of said engine to a drivetrain of said vehicle for driving said vehicle when said engine receives and is powered by said fuel, and for connecting said vehicle to said engine such that kinetic energy from movement of said vehicle can be coupled to said engine so as to cause said engine to turn and compress said gas supplied thereto when said vehicle is coasting,
a tank for receiving the compressed gas supplied by said engine,
exhaust valve means for selectively connecting said output pipe of said engine to either an exhaust outlet or to said tank,
a motor which can be run by said compressed gas,
connection means for connecting a mechanical output of said motor to power said vehicle,



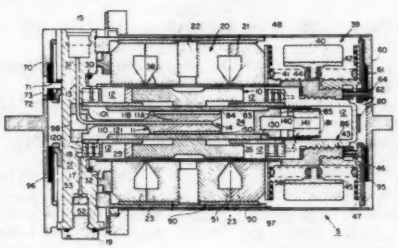
tank valve means for selectively supplying said compressed gas from said tank to said motor, and
control means for causing said exhaust valve means to connect said output pipe of said engine to said tank when said vehicle is moving under its own momentum, whereby the kinetic energy of said vehicle will be stored as compressed gas for later use in powering said vehicle and thereby saving fuel.

4,798,054

LINEAR DRIVE MOTOR WITH FLEXURE BEARING SUPPORT

Graham J. Higham, Ashland, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Oct. 8, 1987, Ser. No. 106,428
Int. Cl.[4] F25B 9/00
U.S. Cl. 62—6 **8 Claims**



1. A cryogenic refrigerator comprising a gaseous working fluid which is alternately compressed and expanded to cool a portion of the working fluid to cryogenic temperatures by an armature driven by a linear drive motor, the linear drive motor comprising:
a magnetic armature reciprocating within a volume;
a housing surrounding the armature that hermetically seals the volume;
a coil assembly surrounding the housing;
a stationary piston attached at one end to the housing and forming a compression space with the armature at the other end, such that the armature alternately compresses and expands the fluid in the compression space; and

support means for supporting the armature at both ends while said armature reciprocates.

4,798,055

REFRIGERATION SYSTEM ANALYZER

Gary P. Murray, Montpelier; Ralph Lower, Bryan; Byron J. Dunham, Sherwood, and Don A. Bulla, Bryan, all of Ohio, assignors to Kent-Moore Corporation, Warren, Mich.

Filed Oct. 28, 1987, Ser. No. 113,654
Int. Cl.[4] F25B *49/00*; G01M *19/00*
U.S. Cl. 62—127 **27 Claims**

1. Apparatus for automatically analyzing a refrigeration system of the type which includes a compressor, condenser and evaporator means having inputs and outputs interconnected by conduit means in a refrigerant loop, said apparatus comprising:

means for reading temperature at a plurality of preselected points around said loop,

means for comparing said temperature readings to each other and to predetermined standards, and for diagnosing a pluarlity of fault conditions as a function of such comparisons,

means for displaying diagnosed fault condition,

a temperature probe constructed for manual placement at each of said preselected points in turn, and

an electronics and display package including said reading means, means for selectively storing each of said temperature readings in turn, said comparing means and said displaying means.

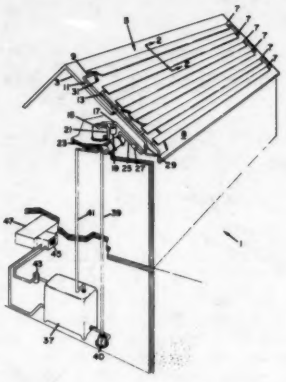
4,798,056

DIRECT EXPANSION SOLAR COLLECTOR-HEAT PUMP SYSTEM

James L. Franklin, Richland, Wash., assignor to Sigma Research, Inc., Redmond, Wash.

Division of Ser. No. 120,227, Feb. 11, 1980, Pat. No. 4,392,359, which is a continuation of Ser. No. 857,569, Dec. 5, 1977, abandoned. This application Dec. 16, 1982, Ser. No. 450,326
Int. Cl.[4] F25B *27/00*
U.S. Cl. 62—235.1 **5 Claims**

1. A combined solar collector-heat pump system comprising a heat absorbing panel, said panel comprising a single generally flat reflective surface member and a plurality of long, narrow, generally flat metallic plates, of substantially the same widths, said plates being generally parallel to each other and being laterally spaced apart and spaced from said reflective surface member by distances which are of the same order of magnitude as the widths of said plates, said metallic plates being directly exposed to the ambient atmosphere, each of said plates having a front face directly exposed to solar radiation and a rear face positioned to receive solar radiation reflected from said reflective surface member, both said faces being highly absorptive of solar radiation and said reflective member having an absorptivity for solar radiation which is low compared to that of said plates, conduit means for fluid in direct heat exchange relation with each of said metal plates, a compressor, an inlet line connecting a first end of each of said conduit means with the suction side of said compressor, a condenser, means for extracting heat from said condenser, an outlet line connecting the high pressure side of said compressor with a first end of said condenser, said inlet line serving to transfer the heat absorbed by said metal plates and fluid in the conduit means to the suction side of said compressor, and said outlet line serving to transfer the absorbed heat and the heat of compression to the first end of said condenser, a return line connecting the second



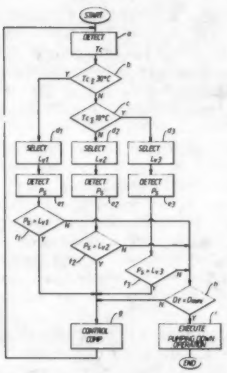
end of said condenser with the second end of said conduit means, a restriction means in said return line, and a working fluid filling said conduit means, inlet line, compressor, outlet line, condenser and return line, said working fluid having a boiling point such that it is vaporized in said conduit means and condensed in said condenser, said working fluid being the only solar-heat-absorbing fluid in said system.

4,798,057

REFRIGERATING APPARATUS AND CONTROL METHOD THEREOF

Hiroshi Okamoto, Fuji; Kimio Fushimi, Shimizu, and Susumu Suzuki, Numazu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 6, 1987, Ser. No. 22,816
Claims priority, application Japan, Mar. 28, 1986, 61-68674
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—228.3 **17 Claims**



1. A refrigerating apparatus comprising:

refrigerant circuit means including a compressing section

having a variable suction pressure, a heat discharging section and a heat absorbing section for communicating refrigerant therethrough; and

means for controlling the operation of the compressing section, the control means including:

means for stopping the operation of the compressing section when the suction pressure of the compressing section falls below a preset lower limit value, and

means for varying the lower limit value in response to the condensation temperature of the refrigerant in that heat discharging section.

4,798,058

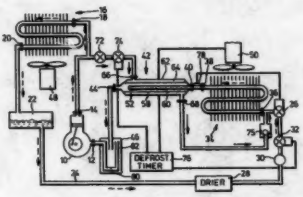
HOT GAS DEFROST SYSTEM FOR REFRIGERATION SYSTEMS AND APPARATUS THEREFOR

Charles Gregory, 1348 #5 Highway, Burlington, Ontario, Canada L7R 3X4

Continuation-in-part of Ser. No. 834,524, Feb. 28, 1986, abandoned. This application Aug. 7, 1987, Ser. No. 82,707

Int. Cl.[4] F25B *47/00*

U.S. Cl. 62—278 **59 Claims**



10. A hot refrigerant fluid defrost system for use in a refrigeration system for defrost of a coil or coils thereof, the system comprising:

a controllable flow valve adapted for connection to the outlet of a compressor pump to receive hot compressed refrigerant fluid therefrom;

a coil to be defrosted having an inlet and an outlet; and

a liquid refrigerant vaporizer connected to the coil for vaporizing liquid fluid issuing from the coil outlet to prevent its delivery to the compressor inlet, the vaporizer comprising first inner, second middle and third outer pipes mounted one within the other to provide a first inner flow passage in the first inner pipe, a second annular flow passage between the first inner and second middle pipes, and a third annular flow passage between the second middle and third outer pipes;

wherein the first inner pipe is adapted for connection at one end to the coil outlet so as to receive the fluid exiting from the coil, is closed at the other end, and is provided in its wall with a plurality of bores distributed along its length so that the refrigerant fluid flowing therein exits therefrom through the bores to impinge against the inner wall of the second middle pipe for heat exchange therewith;

the total flow area provided by all of the said bores being between 0.5 and 1.5 times the cross-sectional flow area of the first inner flow passage;

wherein the second middle pipe is of heat conductive material, the first annular flow passage is closed at one end and is adapted for connection at its other end into the refrigeration system for delivery of the refrigerant fluid therefrom;

wherein the cross-sectional flow area of the said second annular flow passage is at least 0.5 times the cross-sectional flow are of the first inner flow passage; and

wherein the third annular flow passage has an inlet thereto and an outlet therefrom for the hot refrigerant fluid, the inlet and the outlet being spaced from one another for the hot refrigerant fluid to contact the outer wall of the second middle pipe for heat exchange therewith, the inlet being connected to the said controllable flow valve for the flow therethrough to be controlled by the valve, and the outlet being connected to the coil inlet for delivery of the fluid thereto.

4,798,059

AIR CONDITIONER WITH HEAT REGENERATION CYCLE

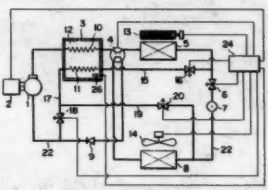
Keiichi Morita, Fujinomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 3, 1987, Ser. No. 92,540

Claims priority, application Japan, Jan. 30, 1987, 62-18643

Int. Cl.[4] F25B *27/00*

U.S. Cl. 62—228.4 **9 Claims**



1. An air conditioner having a refrigeration cycle comprising:

a variable-capacity compressor having a predetermined maximum capacity;

an indoor heat exchanger;

an expansion device;

an outdoor heat exchanger;

a refrigerant circulation means connecting all of said previously recited components thereby forming a closed circuit through which a refrigerant flows;

an indoor fan for introducing air into the indoor heat exchanger;

an outdoor fan for delivering air to the outdoor heat exchanger; and

regeneration means connected to the circulation means, at a point between the discharge side of the compressor and the expansion device, for storing residual heat of the refrigerant, whereby during an ordinary heating operation and during a regenerating operation heat from the compressor is stored into the regeneration means; and

drive means for, during the regenerating operation, stopping the indoor fan and driving the compressor at a capacity that is less than the predetermined maximum capacity.

4,798,060

EVAPORATIVE COOLER APPARATUS

Carl K. Long, 8209 Willeta Ave., Las Vegas, Nev. 89123, and George E. Kozel, Las Vegas, Nev., assignors to Carl K. Long, Las Vegas, Nev.

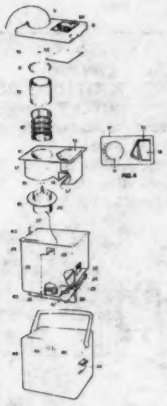
Filed Dec. 29, 1986, Ser. No. 947,030

Int. Cl.[4] F28D *5/00*

U.S. Cl. 62—310 **4 Claims**

1. In a portable evaporative cooler comprising a housing having an air inlet and an air outlet port thereon, a water sump and sump pump means, the improvement comprising a rotatable impeller assembly comprising an evaporative pad and a frame on which said pad is supported, means for rotatably driving said impeller assembly, and a shroud around said impeller assembly, said shroud including an air/water separator extending into said sump for directing excess water from said impeller assembly and deflecting sump water away from said impeller assembly during wave action, said sump pump delivering water from said sump to said evaporative pad, whereby

said impeller assembly is rotatably driven thereby creating a partial vacuum to force outside air into said cooler through



said air inlet port and outwardly therefrom through said outlet port.

4,798,061

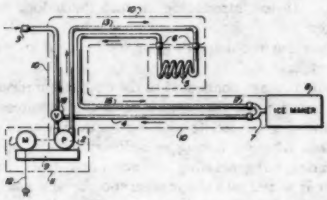
PRE-COOLER APPARATUS AND METHOD FOR INCREASING ICE MAKER OUTPUT

Dennis B. LaConte, 113 Spring Lake Dr., Debary, Fla. 32713

Filed Mar. 15, 1988, Ser. No. 168,400

Int. Cl.[4] F25C *1/00*

U.S. Cl. 62—348 **4 Claims**



1. An apparatus for pre-cooling water for ice makers to be used in combination with a pre-existing, self-contained beverage system having an ice bank, said apparatus comprising:

an electrically-driven water pump having an inlet line from the ambient water supply and an outlet line;

a coiled tube immersed in the ice bank of the beverage system, which is connected at its intake end to the outlet tube from the water pump, and at its discharge end to a water feedline of an ice maker; and

a return water line from the ice maker to the inlet tube of the water pump for recirculation of the water.

4,798,062

PORTABLE FOOD FREEZER WITH INTERNAL HELICAL CONVEYOR

Thomas L. Lipinski, Plymouth, and Joseph L. Goedker, St. Cloud, both of Minn., assignors to Checker Machine, Inc., New Hope, Minn.

Filed Apr. 28, 1988, Ser. No. 187,294

Int. Cl.[4] F25D *25/02*

U.S. Cl. 62—381 **16 Claims**

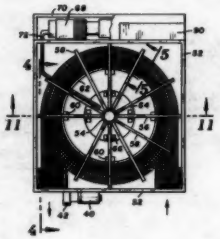
1. An apparatus for serially treating items for a predetermined time as they are transported within a controlled environment, said apparatus including:

an enclosed housing including a base, a top, and an upright side wall means joining the base and top;

an upright support means inside the housing and fixed with respect to the housing;

a plurality of elongate, substantially rigid carrier members having a substantially uniform cross-section, said carrier members being fixed with respect to said support means and arranged in a helical path about a substantially vertical axis, with each carrier member generally radially disposed;

a first elongate carrier band, substantially rigid in the vertical direction and having a plurality of band apertures formed horizontally therethrough and at least generally conforming to said carrier member cross-section in size and shape, adjacent ones of said band apertures spaced apart from one another an amount corresponding to a first arcuate distance between adjacent ones of said carrier members at a predetermined first radius, whereby said carrier members cooperate to support said band in a substantially helical configuration along said helical path, each carrier member extended through an associated one of said band apertures;



a generally flat endless conveyor means for supporting and serially conveying a plurality of items, said conveyor means supported by gravity above and with respect to said carrier band in spaced apart relation to said carrier members;

an inlet and an outlet formed through said housing at respective first and second locations along said conveyor means and near opposite ends of said helical path, and a moving means mounted with respect to said housing for moving said conveyor means relative to said carrier band and support means, to transport said items serially along said helical path from said inlet to said outlet at a predetermined velocity; and

a control means for controlling the environment inside of said housing to effect a selective treatment of said items as they are transported along said helical path.

4,798,063

BEVERAGE COOLER

James Rimmer, Rte. 1, Arkona, Ontario, Canada N0M 1B0

Filed Nov. 23, 1987, Ser. No. 123,727

Int. Cl.[4] F25D *3/08*

U.S. Cl. 62—457 **1 Claim**

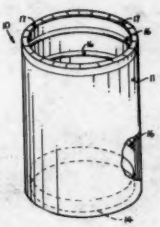
1. A cooling device for use in cooling cylindrical vessels positionable therein comprising,

a plural walled container formed of rubber-like material of varying density for limiting heat flow through said walls, and

a cap means formed of a series of individual flexible flap portions defining and entrance of said container integrally formed to said container for firstly securing and accommodating an exterior surface of a vessel positionable within said container and for secondly sealing and engag-

ing said exterior surface to thereby limit heat flow to the interior of said container, and

wherein the pluraled walls comprise three walls wherein said exterior wall is of greatest density, said central wall is of intermediate density, and said interior wall of least density wherein the exterior wall maintains the integrity of the configurational shape and the central and interior walls discourage heat flow through the walls, and



wherein a plurality of spaced continuous circumferential ribs are positioned and integrally formed onto the inner wall along the length thereof for providing air pockets against a vessel positionable within said container, and

wherein a flexible membrane is secured to a defined floor of the container wherein said membrane has positioned therein a refrigerant.

4,798,064

CAM SEGMENT FOR A KNITTING MACHINE

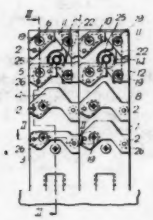
Martin Elsäßer, Stuttgart, and Erwin Schäberle, Gäufelden, both of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 952,329, Oct. 18, 1978, abandoned. This application Aug. 29, 1980, Ser. No. 175,927

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 2746725

Int. Cl.[4] D04B *15/32*

U.S. Cl. 66—57 **2 Claims**



1. A cam device for being mounted on a cam base plate of a knitting machine, comprising: a group of first elements including a plurality of first cam parts, each first element having an opening and being made by stamping and having a first element assembly surface and a first outer surface on opposed sides thereof; a second element for being stationary mounted on a knitting machine, said second element being made by stamping and having a first receiving assembly surface for the stationary and interchangeable mounting of at least one of said first elements at at least one location on the cam device with said first assembly surfaces facing each other; a fastening element for fastening said first element on the cam device at said location and projecting with play through said opening of said first element; and cooperating first positioning means for positioning said first element on said second element before fastening said fastening element, said first positioning means including associated members, one of said members being a recess being defined in one of said first assembly surfaces and the associated member being at least one raised portion for engaging said recess and rising above the other one of said first assembly surfaces, said recess and said raised portion being made by stamping and in one piece with said elements during manufacture thereof and being of such configuration, that said first element may be accurately orientated and held on said second element in a selected needle guidance position at said location before fastening said fastening element, and wherein said second element has at least one spacing disc being defined on said first receiving assembly surface for spacing the first element assembly surface from said first receiving assembly surface in the assembled condition of said first and said second element, said spacing disc being made by stamping and in one piece with said second element during manufacture thereof.

4,798,065

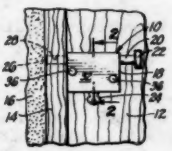
LOCK HAVING A REVERSIBLE RIGHT AND LEFT HAND BOLT

William DeForrest, Sr., 1825 Via Burton, Anaheim, Calif. 92806

Filed May 26, 1987, Ser. No. 53,843

Int. Cl.[4] E05B *65/06*

U.S. Cl. 70—129 **17 Claims**



1. A lock mechanism which comprises:

a mechanism body, said mechanism body having an outside surface, said body including first and second openings located in said outside surface of said body in opposing positions distal to one another on said body;

said body having a continuous elongated essentially straight bolt passageway extending between said first opening and said second opening;

an elongated essentially straight bolt having ends, said bolt movably located in said bolt passageway to slide back and forth in said bolt passageway, said bolt of a size longer than said bolt passageway whereby said bolt can be positioned in said bolt passageway in a first orientation with one of said ends of said bolt extending exterior of said outside surface of said body beyond said first opening and said bolt can be further positioned in said bolt passageway in a second orientation with one of said ends of said bolt extending exterior of said outside surface of said body beyond said second opening;

bolt movement limiting means operatively associated between said bolt and said body for limiting movement of said bolt between first and second limits in said bolt passageway in both of said first and second orientations;

a lock means for locking and unlocking, said lock means including an operator means for locking and unlocking said lock means, said lock means positioned in said body such that said operator means is positioned in association with said surface of said body so as to be accessible from the exterior of said body; and

a bolt detent member for retaining said bolt in a locked position in said bolt passageway, said bolt detent member located in said body in operative association with said lock means and moved both rotationally and translationally by said lock means between a first position wherein said bolt detent member interacts with said bolt to retain said bolt in said locked position in said bolt passageway and a second position wherein said bolt detent member does not

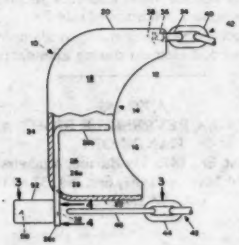
interact with said bolt and said bolt is free to slide between said limits in said bolt passageway.

4,798,066

AUTOMOBILE IGNITION LOCK COVER WITH CHAIN AND BRACKET MOUNTING

Joseph E. Solow, Plainview, N.Y., assignor to Wolo Manufacturing Corporation, Deer Park, N.Y.

Filed Feb. 5, 1988, Ser. No. 152,636
Int. Cl.[4] B60R 25/02
U.S. Cl. 70—212 8 Claims



1. An automobile steering column ignition lock cover comprising:

a cover housing having upper and lower ends defined by top, bottom, and back walls, and further having a pair of opposed sidewalls, wherein the top and bottom walls and sidewalls form an open front side, wherein the sidewalls have edges adapted to rest against an automobile steering column, wherein the housing has a hollow interior for fitting over a steering column-mounted ignition lock; and wherein the housing has a slot in the lower end adjacent to the back wall;

a bracket member having a first portion disposed in said interior and being affixed to said back wall and an outside bracket portion which extends through said slot to the exterior of said housing, said outside bracket portion having means for engaging an adjustable shackle and lock assembly;

a flexible tension bearing element having first and second ends;

means for attaching the first end to the upper end of the cover housing;

an adjustable shackle and lock assembly means for releasably securing the second end of the flexible tension bearing element to said outside bracket portion, wherein said assembly includes a U-shape shackle and a lock housing means for receiving the shackle and for securing the shackle at a plurality of axial positions for adjusting the position of said second end relative to said bracket.

4,798,067

STEERING WHEEL LOCK FOR MOTOR VEHICLES

Karl Peitsmeier, Neuhausen, and Gottfried Schremmer, Tamm, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 30, 1987, Ser. No. 79,521
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626925
Int. Cl.[4] B60R 25/02
U.S. Cl. 70—252 13 Claims

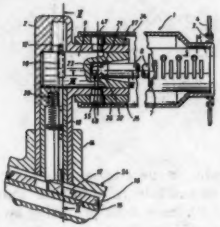
1. Steering wheel lock for motor vehicles with a steering column of adjustable inclination, comprising

a detent pin housing connected to an outer tube surrounding a steering column,

a locking cylinder housing adjoining the detent pin housing and having a locking cylinder, a locking cylinder housing end piece surrounding a key insertion orifice arranged in a percration of a vehicle dashboard, said locking cylinder housing having one end located in the dashboard so as to be displaceable in an axial direction only,

wherein the detent pin housing is pivotably connected for movement about at least one connecting axis relative to the locking cylinder housing, by a gimbal coupling connecting the housings such that a shaft stressed by a rotor of the locking cylinder is engaged with a control shaft acting on a detent pin by a gimbal connection,

wherein the control shaft is mounted rotatably in the detent pin housing and, in an angled position, is arranged firmly in the latter so as to be pivotable relative to the locking cylinder housing,



wherein the locking cylinder housing forms a square tube at least in the end region pointing towards the detent pin housing, said square tube engagably surrounding a square housing part connected to the detent pin housing, wherein the square tube is connected pivotably, on two parallel first side faces at two points through which a first axis runs perpendicularly, to the first side faces to opposite respective parallel first side faces of the housing part, and

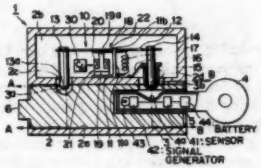
wherein second side faces of the square tube, which are aligned approximately perpendicularly to these first side faces, and second side faces of the housing part are at a distance from one another which allows pivoting about the first axis.

4,798,068

ELECTRICALLY CONTROLLED TYPE CYLINDER FOR LOCKS

Shunsaku Nakauchi, Mitaka, Japan, assignor to Kokusai Gijutsu Kaihatsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 124,249
Claims priority, application Japan, Nov. 27, 1986, 61-282455; Sep. 22, 1987, 62-145016[U]
Int. Cl.[4] E05B 47/00
U.S. Cl. 70—276 10 Claims



1. A cylinder for locks containing an outer barrel and an inner cam with a keyhole such that a rotating operation of said inner cam can be carried out inside said outer barrel by means of an operating means which is to be inserted in the said keyhole in the said inner cam, said cylinder comprising:

an arm component which is installed in an inner space of said

outer barrel by a supporting member and supported such as to allow free see-saw or pivot action,

a through hole defined in said outer barrel,

an engaging hole placed in the said inner cam such that when said inner cam and said outer barrel are in the correct position both said through hole and said engaging hole are in alignment,

a pin component mounted on said arm component, said pin component being for prohibiting relative motion of said inner cam to said outer barrel when said pin component is inserted into said engaging hole through said through hole,

a spring means for urging said arm component in a direction where said pin component is withdrawn from said engaging hole,

a driving mechanism for driving said pin component into the said engaging hole overcoming the opposing force provided by the said spring means in response to a prescribed operation of said operating means and,

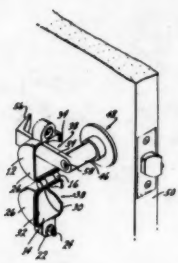
a holding mechanism for holding a condition where said pin component is engaged into said engaging hole without consuming electric power when said pin component enters a predetermined state with respect to the engaging hole, said holding mechanism being capable of releasing said pin component from the held position when an electric signal is received.

4,798,069

PROTECTING DEVICE FOR LEVER HANDLE DOOR LOCKS

William DeForrest, Sr., 1825 Via Burton, Anaheim, Calif. 92806

Filed Jan. 19, 1988, Ser. No. 145,387
Int. Cl.[4] E05B 17/14
U.S. Cl. 70—428 2 Claims



1. In a protection device of the type having first and second protector halves hingedly associated with each other, said first and said second halves joining together along a substantially planar junction, said halves when associated together along said planar junction substantially forming a hollow united body, said united body having a closed bottom wall and a substantially cylindrical circumferential wall, said body having a top wall, locking means adapted to releasably secure said first and said second halves together maintaining said first and said second halves as a united body, said locking means including first and second lugs respectively secured to said first and said second halves on said circumferential wall the improvement consisting of:

said top wall including an opening opening into the hollow interior of said united body, said opening formed in said first and said second halves such that a portion of said opening is located in one of said first or said second halves and the remaining portion of said opening is located in the other of said first or said second halves and together said portions form a singular opening in said top wall when said halves are associated together along said planar junction to form said united body;

said opening sized and shaped to receive an outwardly extending shank of a lever handle door lock, said shank portion including a cylindrical lock located therein;

said circumferential wall including an elongated rectangular opening into the hollow interior of said body, the elongated dimension of said rectangular opening located essentially parallel to said top wall;

said rectangular opening sized and shaped so as to accept the lever portion of a lever handle door lock;

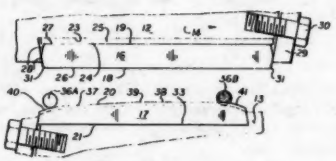
said protection device fitting over said lever handle door lock by passing said handle portion of said lever handle door lock through said rectangular hole and positioning said opening in said top wall of said protection device around the shank of said lever handle door lock whereby when said halves of said protection device are associated together to form a united body the shank portion of said lever handle door lock including said cylinder lock located therein are located within the interior of said body with a portion of said lever section of said lever handle door lock extending from the interior of said body through said rectangular opening to the exterior of said body.

4,798,070

COMBINED THREAD ROLLING DIES

Robert J. Hlavaty, Avon Lake, Ohio, assignor to Colt Industries Operating Corporation, W. Hartford, Conn.

Filed Jul. 1, 1983, Ser. No. 509,932
Int. Cl.[4] B21H 3/06
U.S. Cl. 72—88 7 Claims



1. A thread rolling die set consisting of only first, second, and third dies for use in a thread rolling machine having only a single pair of dies therein at any one time to roll threads on a workpiece, comprising, in combination:

said first die having first and second opposed faces,

thread forming ridges on said first face having the crest thereof lying parallel to said second face;

said second die having first and second opposed faces with said second face being a flat plane adapted to engage a die holder in the thread rolling machine which is non-adjustable as to tilt;

said second die first face having thread forming ridges thereon with the crests of a first longitudinally tapered portion thereof being at a slight angle to said second die second face and with the crests of a second longitudinal dwell portion thereof being parallel to said second die second face, said first faces of said first and second dies cooperating to roll threads on a workpiece when said first and second dies are mounted in a thread rolling meachine;

said second face of said first die including thread forming ridges the crests of which lie parallel to said first die first face;

said third die having first and second opposed faces with said second face being a flat plane and with said third die first face having thread forming ridges thereon with the crests of a first longitudinally tapered portion thereof being at a slight angle to said third die second face and with the crests of a second longitudinal dwell portion thereof being parallel to said third die second face, said first die being reversible face-to-face in the thread rolling machine and said second die being removable from the machine;

said first face of said third die cooperating with said second face of said first die to roll threads on a workpiece when

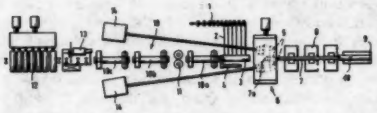
said first and third dies are mounted in a thread rolling machine.

4,798,071

SEAMLESS TUBE PRODUCTION

Karlhans Staat, 4030 Ratingen 8, and Hermann Möltner, 4048 Grevenbroich 2, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,298
Int. Cl.[4] B21B *19/04*
U.S. Cl. 72—97 **20 Claims**



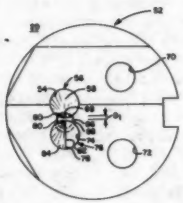
1. Process for seamless tube production comprising
(a) heating an ingot to rolling temperature;
(b) piercing said ingot to form a hollow tube in a pass opening having an axis defined by a mandrel and rolls in a skew rolling mill;
(c) reversing the direction of rotation of said rolls and stretching said hollow tube by passing said hollow tube in reverse direction through said same rolling mill and along said same axis to form a tube bloom;
(d) said stretching taking place immediately after piercing during the same heat.

4,798,072

SPRING COILING MACHINE WITH DUAL ARBORS

Peter Vanmeggelen, Mississauga, Canada, and John Jacobson, Southington, Conn., assignors to Newcomb Spring Corp., Southington, Conn.

Filed Jul. 31, 1987, Ser. No. 80,638
Int. Cl.[4] B21F *3/10, 11/00*
U.S. Cl. 72—132 **19 Claims**



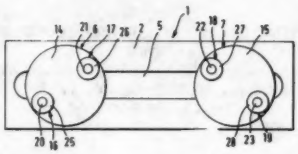
1. A spring coiling machine having a front panel including a coiling station, comprising:
(a) a form arbor having a nose projecting from the panel;
(b) a block wire guide in close vertical spaced relation to the form arbor;
(c) a coiling point in close side spaced relation to the form arbor;
(d) a pitch tool in close side spaced relation to the form arbor, opposite the coiling point;
(e) means for feeding a supply of wire between the wire guide and the form arbor, between the coiling and the form arbor and against the pitch tool, such that during said feeding the wire is plastically deformed into a coil having a series of adjacent generally helical turns;
(f) blade means operative downstream of the coiling point for severing a coil from the supply of wire;
(g) means for controlling the position of the coiling point during coil formation, to produce a coil having turns of different diameter;
(h) a retractable cutting arbor situated between the form arbor and the blade means, the cutting arbor operative in a retracted position within the panel during the forming of small diameter turns, and movable to an active position projecting from the panel into a large diameter turn to provide a cutting mandrel against which the blade means can sever said large diameter turn from the supply of wire, the timing of the retracting motion of the cutting arbor being responsive to the means for controlling the position of the coiling point; and
wherein the form arbor nose has an arcuate, tapered portion in contact with the feed wire, and a flat profile portion facing the cutting arbor.

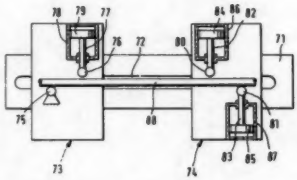
4,798,073

BENDING MACHINE FOR BENDING BARS, CHANNELS, SECTIONS AND THE LIKE

Helmut Dischler, Droste-Heuelshoff-Str. 9, D-4040 Neuss, Fed. Rep. of Germany

Filed Dec. 15, 1986, Ser. No. 941,650
Int. Cl.[4] B21D *11/04*
U.S. Cl. 72—218 **17 Claims**





1. A bending machine, comprising:
(a) support means;
(b) first and second spaced cooperating bending means displaceably associated with said support means;
(c) each of said bending means comprises first and second spaced cooperating bending components and the components of said first and second bending means define a first axis extending between said bending means and further define second and third axes extending generally transverse to said first axis and about which a length to be bent may pivot and each of said second and third axes is disposed between the components of one of said bending means and said components of each bending means being sufficiently spaced apart to receive therebetween a length to be bent which extends also between said bending means on said first axis;
(d)
drive means operably associated with at least one of the components of each of said bending means for causing displacement thereof relative to said first axis; and,
(e) guide means operably associatd with said support means and with each of said bending means so that displacement of said components by said drive means causes said components to move relative to said first axis and to engage a

length to be bent extending between said bending means and received between the associated components and further causes said bending means to move along said guide means relative to each other so that the length pivots about said second and third axes and is bent intermediate said bending means.

4,798,074

ROLLING MILL STAND, ESPECIALLY FOR ROLLING STRIP

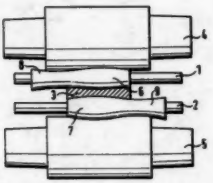
Hugo Feldmann, Alsdorf; Friedrich Hollmann, Grevenbroich; Horst Gärtner, and Gerd Beisemann, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 20, 1987, Ser. No. 75,376

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1986, 3624241

Int. Cl.[4] B21B *31/18, 27/02*

U.S. Cl. 72—247 **8 Claims**



1. A strip-rolling mill comprising a multiplicity of rolls including a pair of working rolls defining a rolling gap between them in which strip having opposite longitudinal edges is rolled, and at least one pair of other rolls bracing said working rolls, at least the rolls of one of said pairs being shiftable in opposite axial directions relative to one another, each of said rolls having a roll body of a length greater than a width of said strip between said edges and pins extending from opposite ends of the respective body with which the respective roll is journaled and driven, the bodies of at least said one of said pairs of rolls having contours with a constant curvature from one roll body end to an opposite roll body end with a bulging portion tapering to one roll body end and a concave portion diverging to an opposite roll body end so that said portions are complementary to one another and said contours are complementary to one another, one of the roll bodies having said contours having one of its ends aligned and coplanar with one of said longitudinal edges of said strip and the other of the roll bodies having said contours having its opposite end aligned and coplanar with the other of said longitudinal edges of said strip.

4,798,075

METHOD AND APPARATUS FOR MAKING A BOWED EXTERNAL SPRING RETAINING RING OF THE E-SHAPED TYPE

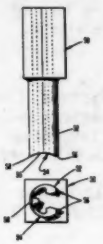
Edmund F. Killian, Merrick, and Wallace H. Berliner, Woodside, both of N.Y., assignors to Waldes Truarc Inc., Long Island City, N.Y.

Division of Ser. No. 650,662, Sep. 14, 1984, abandoned. This application Jul. 23, 1986, Ser. No. 888,468

Int. Cl.[4] B21D *28/02*

U.S. Cl. 72—327 **4 Claims**

1. A punch for making a bowed external spring retaining ring of the E-shaped type of generally U-shaped cross section and symetrically bowed about a line transverse to its longitudinal axis and comprising an open-ended spring steel ring which includes a middle section **32**, a pair of end sections **34**, and a pair of intermediate sections **36** which interconnect the end sections **34** with the middle section **32**, the end sections **34** each including lugs **37** which are spaced apart to define an opening **38** located opposite the middle section **32**, a middle prong **39** projecting radially inwardly from the middle section **32** having flats **40, 41** formed in the middle section **32** and the end sections **34** to define the trailing and leading ends of the ring the flats **40, 41** being mutually coplanar, the punch comprising a shank having a cross section shaped in the manner of the ring cross



section and an end face including a portion bowed concavely to form the bow in the ring and planar straight portions **(56, 58)** inclined away from the end of the punch by a small angle forming the straight leading and trailing ends **(59, 61)** of the ring.

4,798,076

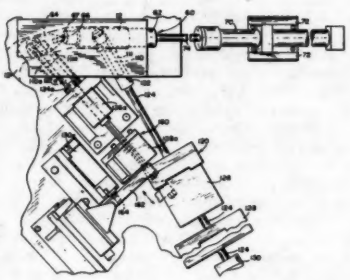
NIPPLE FORMING APPARATUS

Donald R. Rigsby, Jenison; James R. Dehlinger, Ada, and David A. Passmore, Wayland, all of Mich., assignors to Benteler Industries, Inc., Grand Rapids, Mich.

Filed Feb. 26, 1988, Ser. No. 160,780

Int. Cl.[4] B21D *31/00, 22/00*

U.S. Cl. 72—352 **12 Claims**



1. Nipple drawing apparatus for forming a lateral nipple around a lateral opening in an elongated exhaust manifold tubular body comprising:

a mandrel for insertion axially into the tubular body, said mandrel having at least one generally cylindrical recess oriented transversely of said mandrel;

a forming die in said recess, movably guided by said recess to enable extension of said die transversely of said mandrel to form a nipple on the tubular body around said lateral opening;

a drawing rod for rotary interlock with said forming die;

rotary interlock means on said rod and said die for temporary interlock thereof and subsequent release thereof;

a transfer actuator connected to said drawing rod, axially actuable to transfer said rod toward said die into engagement with said die and subsequently away from said die for retracting said rod from said die;

a rotary actuator for said rod for actuating said rotary inter-

lock means and thereby rotationally interlocking said rod to said die when engaged, and for subsequent rotational release therefrom; and

a forming actuator connected to said rod, axially actuable in the opposite direction as the engagement direction of said transfer actuator, to move away from the tubular body, for forcefully drawing said rod and die away from the tubular body to form the nipple, and then toward the tubular body to return the die.

4,798,077

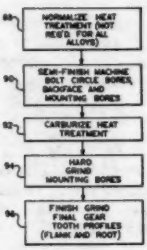
METHOD FOR PRODUCING A FAMILY OF FORGED RING ROLLING PREFORMS AND FORGING DIE THEREFOR

James R. Douglas, Mentor, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 12, 1987, Ser. No. 14,428

Int. Cl.[4] B21J *1/06*; B21D *22/00*

U.S. Cl. 72—360 **13 Claims**



1. A method for forging a series of ring rolling preforms, each preform of said series to be ring rolled into a ring shaped forging blank for precision forging into a near net ring gear forging of known outside diameter, toe diameter and total volume, at least one of said outside diameter, toe diameter and total volume of the near net ring gear forging to be produced by each member of said series of preforms being different than the outside diameter, toe diameter and total volume of the near net ring gear forging to be produced by the other members of said series of ring rolling preforms, said method comprising:

providing a preform forging die having a die cavity comprising a substantially toroidal shaped portion of given volume and of given cross-sectional interior diameter, a disc shaped portion extending radially inwardly from said generally toroidal shaped portion and an overflow portion extending radially outwardly from said generally toroidal shaped portion, said overflow portion in cross-section being generally traingular shaped and defined by flat surfaces extending from said toroidal shaped portion radially outwardly and tangentially toward the parting surface of said die to define an included angle therebetween; and

forging preforms utilizing said preform forging die if the volume of the near net ring gear forging to be produced therefrom is in the range of eighty percent (80%) to one hundred percent (100%) of the volume of said toroidal cavity portion.

4,798,078

REBAR CUTTING AND BENDING MACHINE

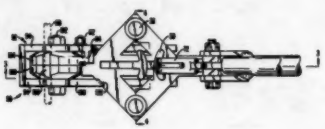
Leonard J. Schweitzer, 3272 Susileen Dr., Reno, Nev. 89509

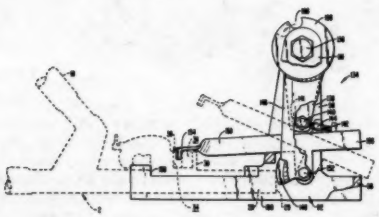
Filed Jun. 8, 1987, Ser. No. 59,703

Int. Cl.[4] B21D *9/10, 43/28*

U.S. Cl. 72—389 **32 Claims**

1. Apparatus for cutting a metal bar for use in conjunction with and activation by a bar-bending machine having an elongated base for supporting the machine on the ground, a bar-bending mechanism at a first end of the base including a linearly reciprocable slide adapted to apply a bending force to the bar during the bending operation, guide means connected with the base for guiding the slide during its linear movements, and handle means pivotally attached to the base and operatively coupled to the slide for linearly moving the slide in the guiding means between first and second positions in response to corresponding pivotal movements of the handle means so that the slide protrudes from the guide means when it is in the second position, the apparatus comprising a generally L-shaped support frame defined by generally transverse, interconnected legs, a first leg including holding means for mechanically engaging the base of the bending machine adjacent the first end thereof to prevent relative movements between the bending machine and the frame at least in the direction of linear movements of the slide in the guide means, first and second bar





cutting discs having opposing faces in substantial contact with each other and mounted to the frame for relative pivotal movement about an axis substantially perpendicular to the direction of movement of the slide in the guide means, each disc including an aperture and the aperatures and the discs being positioned so that they can be axially aligned means preventing pivotal movements of the first disc, and an actuating arm protruding from the second disc, the arm being arranged relative to the base of the bending machine so that an end of the slide protruding from the guide means engages the arm and moves it to thereby pivotally move the second disc relative to the first disc when the handle means is operated to move the slide towards the second position, whereby a bar placed in the disc aperatures while the aperatures are in mutual alignment is cut when the slide is moved from the first to the second position.

4,798,079

FASTENER INSTALLATION APPARATUS

Michael Miles, Stevenage, and Stephen R. Tarling, Harpenden, both of England, assignors to Avdel Limited, a British Company, Welwyn Garden, England

Filed Apr. 7, 1987, Ser. No. 35,189

Claims priority, application United Kingdom, Apr. 11, 1986, 8608817

Int. Cl.[4] B21J *15/28*

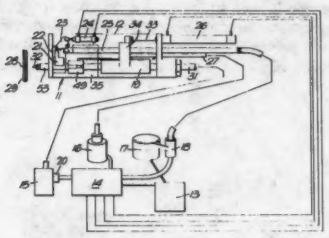
U.S. Cl. 72—391 **11 Claims**

1. Fastener installation apparatus for installing fasteners, which comprises:

fastener installation means including an aperture into which part of a fastener to be installed thereby is inserted;

vacuum means, connected to the aperture, for drawing air in through the aperture; and

vacuum level detection means communicating with a region



subject to a vacuum drawn by said vacuum means for detecting whether the level of vacuum in said region corresponds to the presence of a fastener in the aperture of the installation means.

4,798,080

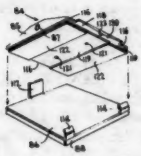
PORTABLE TESTER FOR MEASURING SLIP RESISTANCE

Robert J. Brungraber, 409 S. 21st St., Lewisburg, Pa. 17837

Division of Ser. No. 60,302, Jun. 10, 1987, Pat. No. 4,759,209. This application Apr. 7, 1988, Ser. No. 178,640

Int. Cl.[4] G01N *19/02*

U.S. Cl. 73—9 **2 Claims**



1. A foot plate assembly for a slip testing machine comprising a foot plate carrier having connection means for attaching same to a lower portion of the machine for pivotal movement about a first axis, a combination foot plate and friction pad, and attachment means providing a clip-on connection between the carrier and the combination foot plate and pad with the facility for the combination foot plate and pad to tilt about a second axis perpendicular to the first axis.

4,798,081

HIGH TEMPERATURE CONTINUOUS VISCOMETRY COUPLED WITH ANALYTIC TEMPERATURE RISING ELUTION FRACTIONATION FOR EVALUATING CRYSTALLINE AND SEMI-CRYSTALLINE POLYMERS

Lonnie G. Hazlitt, Lake Jackson, and Daniel G. Moldovan, Danbury, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 802,354, Nov. 27, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 137,118

Int. Cl.[4] G01N *11/00*

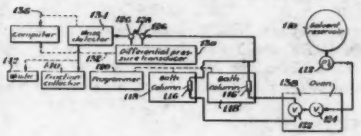
U.S. Cl. 73—53 **32 Claims**

1. A method for analyzing a solution of a crystalline or a semi-crystalline polymer sample comprising the steps of:

(a) precipitating the polymer sample solution over a cooling temperature gradient to produce a precipitated polymer sample, said precipitated polymer sample being precipitated as a function of its crystallinity or branching configuration or density;

(b) eluting said precipitated polymer sample over a heating temperature gradient to produce successive fractions of a fractionated polymer sample solution;

(c) successively measuring the instantaneous concentration of the successive fractions of said fractionated polymer sample solution, at a first temperature in excess of a precipitation temperature of said fractionated polymer sample solution, to produce instantaneous concentration c data;



(d) successively measuring the instantaneous specific viscosity of the successive fractions of said fractionated polymer sample solution, at a second temperature in excess of a precipitation temperature of said fractionated polymer sample solution, to produce instantaneous specific viscosity Spv data; and

(e) determining the instantaneous intrinsic viscosity Intv of the successive fractions of said fractionated polymer sample solution in accordance with said instantaneous concentration c data from step (c) and said specific viscosity Spv data from step (d).

4,798,082

CONTROL-DISPLAY DEVICE FOR AN ENGINE-EQUIPED APPARATUS

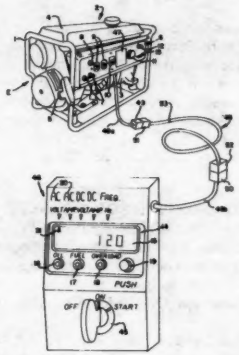
Tetsuzo Fujikawa, Kobe; Yoichi Yamaguchi, and Akira Takahashi, both of Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Sep. 25, 1987, Ser. No. 101,185

Claims priority, application Japan, Sep. 29, 1986, 61-230870

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.3 **10 Claims**



1. A control-display device for an engine-equipped apparatus, said apparatus including analog signal generating circuits and a control mechanism for controlling the operation of the engine, said device comprising computing circuits for converting said analog signals to digital form, digital means for generating a control signal in digital form, means for converting said control signal from digital form to analog form, and coupler means connectable to said analog signal generating circuits and

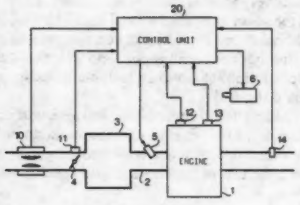
connected to said computing circuits in said device, said coupler means further being connected to said control mechanism and to said converting means and carrying said control signal in analog form, whereby said coupler means is located midway along those circuit of the wiring routes between the engine-equipped apparatus and said display device at which the signals are in analog state, whereby said display device is positionable at a location selectively on or separated from the engine-equipped apparatus.

4,798,083

SYSTEM FOR MEASURING INTAKE AIRFLOW RATE IN AN ENGINE

Yoshiyuki Sogawa, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1987, Ser. No. 43,430
Claims priority, application Japan, May 6, 1986, 61-104412
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.2 **6 Claims**



1. A system for measuring intake airflow rate in an engine for a motor vehicle having an intake passage to the engine, and a throttle valve in the intake passage, the intake passage including a first intake passage upstream of the throttle valve and a second intake passage between the throttle valve and cylinders of the engine, the system comprising:

an airflow meter disposed in the first intake passage for measuring a first intake airflow rate of flow passing in the first intake passage;

first means for calculating a second intake airflow rate of flow into said second intake passage not entering into the cylinders during opening or closing of the throttle valve; and

second means for producing a signal representing intake airflow rate of flow actually admitted into the cylinders in accordance with the difference between the first intake airflow rate and the second intake airflow rate;

the first means comprises third means for calculating the second intake airflow rate based on opening degree of the throttle valve.

4,798,084

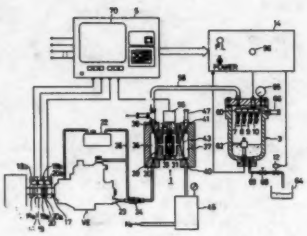
MEASURING DEVICE FOR MEASURING A FUEL INJECTION QUANTITY

Takeshi Takahashi; Naoyuki Tsuzuki; Hidetaka Nohira, all of Toyota; Yukimitsu Omori, and Akio Takamura, both of Tokyo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Ono Sokki Co., Ltd., Tokyo, both of, Japan

Filed Dec. 9, 1986, Ser. No. 939,981
Claims priority, application Japan, Dec. 9, 1985, 60-276537; Dec. 9, 1985, 60-276538; Dec. 13, 1985, 60-281425; Dec. 13, 1985, 60-281426; Dec. 26, 1985, 60-298212; Dec. 26, 1985, 60-298213; Jun. 7, 1986, 61-132198
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A **13 Claims**

1. A measuring device for measuring a fuel injection quantity, comprising:

fuel volume sensing means including a fuel injection chamber connected to a fuel injection valve and receiving said fuel injection quantity therefrom, a back pressure chamber which faces said fuel injection chamber, bulkhead means located between said fuel injection chamber and said back pressure chamber as an intercept therebetween and responsive to said fuel injection quantity for generating a displacement, sensing means for sensing said displacement of said bulkhead means, and pressure means for holding a pressure of the back pressure chamber to be of a constant value,



fuel injection quantity computing means responsive to said sensing means for determining a fuel injection quantity,

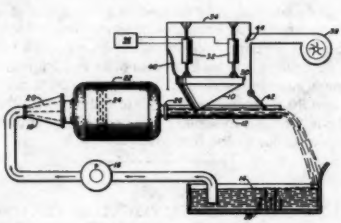
discharging means including fuel discharging means for discharging said injected fuel quantity from said fuel injection chamber to its exterior, discharging quantity computing means responsive to said fuel injection quantity computing means for computing a discharged quantity, and discharge control means responsive to said discharging quantity computing means for controlling said fuel discharging means so as to control said discharged quantity.

4,798,085

TEST RIG FOR EXAMINING SEAL FINGER WEAR

Alexander Malakhoff, Arlington, Va., and Sydney Davis, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 29, 1982, Ser. No. 403,263
Int. Cl.[4] B63B *9/08*; G01M *10/00*
U.S. Cl. 73—148 **1 Claim**



1. An apparatus for testing a seal finger for an air cushion vehicle comprising:

a reservoir of water;

a pump for pumping water from said reservoir;

a diffuser connected to the output of said pump to prevent turbulence in the flow of water from said pump;

a nozzle connected to said diffuser having a narrow opening for producing a high speed flow of water;

a shallow channel for receiving said high speed flow of a water from said nozzle, said channel returning the water to said reservoir;

means for holding said seal finger;

means for moving said means for holding so that said seal finger moves into and out of contact with said flow of water;

means for controlling said means for moving so as to simulate the motion of a ship moving through waves whereby the forces encountered by said seal finger in contact with said water flow simulate the forces encountered in actual use;

an enclosure for covering said means for holding, said means for moving and said seal finger;

a fan for forcing air into said enclosure so as to pressurize the interior of said enclosure;

flexible means for connecting the walls of the enclosure with said means for holding so as to prevent pressurized air from escaping the enclosure except through the seal finger which is thereby inflated;

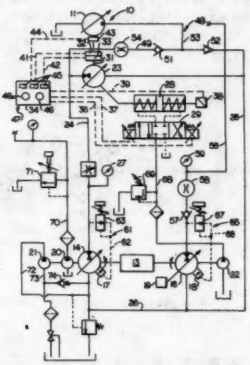
whereby the seal finger is caused to wear in a manner similar to actual use so that accurate testing of the material is accomplished.

4,798,086

TEST BENCH FOR TESTING HYDRAULIC PUMPS AND MOTORS

John Styfhoorn, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 23, 1987, Ser. No. 29,498
Int. Cl.[4] F04B *51/00*; F15B *19/00*
U.S. Cl. 73—168 **8 Claims**



1. A test bench for testing hydraulic pumps and motors comprising:

a primary power source;

a first variable displacement hydraulic device mechanically connected to the power source;

a second variable displacement hydraulic device having a drive shaft connectable to one of a hydraulic pump and a hydraulic motor to be tested;

a conduit interconnecting the first and second variable displacement hydraulic devices;

means for communicating the discharge fluid from the test pump to the conduit when the drive shaft is connected to the test pump;

means for controlling the displacement of the second variable displacement hydraulic device to maintain a preselected constant speed of the drive shaft; and

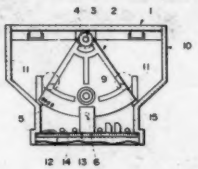
means for adjustably controlling the displacement of the first variable displacement hydraulic device to control the fluid pressure in the conduit.

4,798,087

INCLINATION DETECTOR

Tamio Takeda, Tama, and Minoru Take, Iwaki, both of Japan, assignors to Kabushiki Kaisha Kenwood, Japan

Filed Aug. 20, 1987, Ser. No. 87,192
Claims priority, application Japan, Aug. 22, 1986, 61-127090[U]
Int. Cl.[4] G01C *9/06*
U.S. Cl. 73—649 **4 Claims**



1. A vibration detector comprising a frame;

a fan-shaped plate pivotably mounted with respect to said frame, the plate including a plurality of slits aligned along the peripheral edge thereof;

a photo-coupler including a light-emitting element and light-sensitive element, the two elements being arranged so that the slits are positioned between them where said light-sensitive element produces detection pulses in response to movement of the slits between the two elements due to vibration of said frame; and

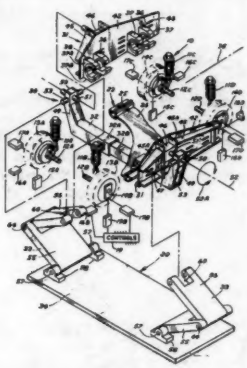
a detection sensitivity changeover circuit connected to said photo-coupler, the changeover circuit including a filter and means for adjusting the time constant of the filter to reduce detection of erroneous detection pulses.

4,798,088

VEHICLE RESTRAINT SYSTEM

Steven R. Haeg, Shorewood, and Mark T. Kraabel, Minneapolis, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Mar. 21, 1988, Ser. No. 170,757
Int. Cl.[4] G01M *17/00*
U.S. Cl. 73—669 **11 Claims**



4. A support and guidance system for vehicles to be tested, wherein the vehicle has a longitudinal axis comprising a fixture to restrain such a vehicle in selected directions positioned at the lateral sides thereof, said fixture including:

a base;

means for securing said vehicle relative to the base; and

support means for the means for securing comprising sup-

port members mounted to the base relative to which the vehicle will be tested, said support means permitting free movement along an axis in direction perpendicular to said longitudinal axis and restraining movement of the vehicle body parallel to the longitudinal axis.

4,798,089

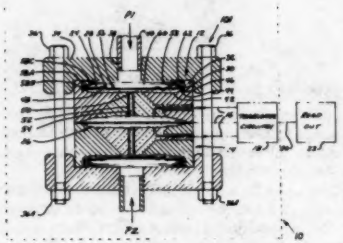
ISOLATOR APPARATUS

Roger L. Frick, Chanhassen, and Dean S. Pierce, St. Paul, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Mar. 12, 1987, Ser. No. 24,981

Int. Cl.[4] G01L *7/08, 9/00, 13/02*

U.S. Cl. 73—706 **17 Claims**



1. Apparatus for isolatingly coupling a pressure from a fluid in an input member to a pressure sensor providing an output as a function of the pressure, comprising:

an inlet port disposed in the apparatus for receiving the fluid from the input member;

isolation means disposed in the inlet port and having an active region bounded by an outer border for isolatingly coupling the pressure from the fluid to the pressure sensor;

sealing means disposed in the inlet port around the isolation means for sealingly coupling the fluid from the input member to the isolation means; and

support means disposed in the inlet port for supporting the sealing means to overlie at least a portion of the isolation means adjacent the outer border and spacing at least the portion of the sealing means away from the active region, such that an effective area of the active region is improved.

4,798,090

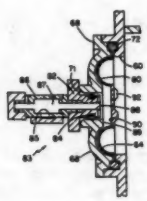
APPARATUS FOR USE WITH FLUID FLOW TRANSFER DEVICE

Gary B. Heath, Aurora; William G. Palsulich, Boulder; Keith J. Manica, Littleton, and Jack C. Swan, Jr., Boulder, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Division of Ser. No. 748,545, Jun. 25, 1985, Pat. No. 4,666,598. This application Feb. 11, 1987, Ser. No. 13,353

Int. Cl.[4] G01L *7/08;* B01D *35/00*

U.S. Cl. 73—715 **8 Claims**



1. Apparatus for sensing the pressure of a liquid comprising means defining a first chamber having an inlet and an outlet for liquid flowing through said first chamber, said means defining a first chamber including a rigid wall having a first opening therethrough,

an impermeable flexible diaphragm sealably covering said opening, said diaphragm including a corrugated portion formed symmetrically about a center portion of said diaphragm, said diaphragm forming means for moving in either direction without stretch or friction so that equal pressures result on opposite sides thereof,

means defining a second chamber sealed around said diaphragm on the other side of said diaphragm from said first chamber, and

a pressure transducer communicating with said second chamber to sense pressure in it,

said first chamber being provided by a cassette that is removably mounted on a machine,

said pressure transducer being mounted on said machine, and

said means defining a second chamber comprising a portion surrounding said transducer mounted on said machine, and a rigid retainer covering said diaphragm, carried by said cassette and having a second opening adapted to sealably engage said portion surrounding said transducer,

said retainer having an inner surface having the same shape as said corrugated portion, whereby said shape allows the region between said inner surface of said retainer and said diaphragam to have a small volume.

4,798,091

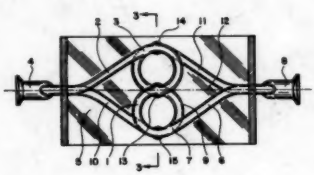
DUAL S-TUBE CORIOLIS FORCE FLOWMETER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 725,986, Apr. 22, 1985, Pat. No. 4,628,744. This application Dec. 15, 1986, Ser. No. 941,352

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 **4 Claims**



1. An apparatus for measuring flow rate comprising in combination:

(a) a frame;

(b) a first sinuous conduit disposed on a first plane and secured to said frame at two extremities thereof, said first sinuous conduit including a first smooth bend adjacent to one extremity of said first sinuous conduit turning about a first direction; a second smooth bend adjacent to said first smooth bend turning about a second direction opposite to said first direction; a third smooth bend adjacent to said second smooth bend turning about said first direction and a fourth smooth bend intermediate said third smooth bend and the other extremity of said sinuous conduit turning about said second direction, wherein the combination of said first and second smooth bends and the combination of said third and fourth smooth bends are axisymmetric to one another about a first axis perpendicular to said first plane and passing through midsection of said first sinuous conduit;

(c) a second sinuous conduit disposed on a second plane parallel to said first plane and secured to said frame at two extremities hereof, wherein said second sinuous conduit and said first sinuous conduit providing two flow passages connected to a common inlet and outlet are axisymmetric to one another about a second axis located half way be-

tween said first and second planes and substantially intersecting said first axis in perpendicular angle;

(d) means for exerting oscillatory force to said first and second sinuous conduits at midsections thereof, wherein said means vibrates said first and second sinuous conduits relative to one another in directions transverse to the planes including said first and second sinuous conduits, and thus creating oscillatory flexural movements of opposite signs for said first and second sinuous conduits; and

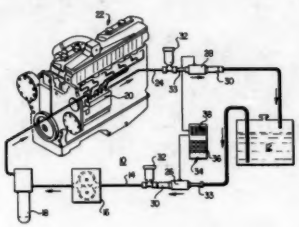
(e) at least a first means disposed at a section of said second smooth bend adjacent to said first smooth bend, and at least a second means disposed at a section of said third smooth bend adjacent to said fourth smooth bend for measuring difference in said oscillatory flexural movements between the combination of said first and second smooth bends and the combination of said third and fourth smooth bends as a measure of mass flow rate of fluid moving through said first and second sinuous conduits.

4,798,092

FLOWMETER FOR USE IN A FLOW MONITORING SYSTEM

Peter J. Lagergren, and David J. Roh, both of Arlington, Tex., assignors to Pandel Instruments, Inc., Grand Prairie, Tex.

Filed May 28, 1987, Ser. No. 55,176
Int. Cl.[4] G01F *1/12*
U.S. Cl. 73—861.77 **7 Claims**



1. A flowmeter for measuring the flow rate of a fluid in a fluid path, comprising:

a look-up table having a plurality of addressable storage locations therein, each of the addressable storage locations including a predetermined flow rate value stored therein equal to a predetermined number of pulses per unit volume of the fluid at a given flow rate;

means for generating a pulse signal having a plurality of pulses, each of the pulses having a pulse width proportional to instantaneous flow rate of the fluid;

control means for receiving the pulse signal and in response thereto determining the pulse width of each pulse therein and for generating a pulse width count in clock cycles proportional to the pulse width of each pulse;

means responsive to each pulse width count in clock cycles for directly selecting one of the plurality of addressable storage locations in the look-up table;

means for retrieving the predetermined flow rate value from the selected addressable storage location; and

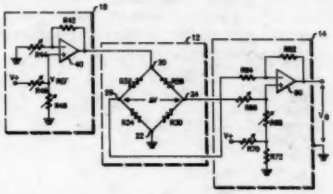
means for averaging one or more flow rate values retrieved from the selected addressable storage locations over a predetermined time period to generate a flow rate signal from the stored flow rate values instead of the pulse signal.

4,798,093

APPARATUS FOR SENSOR COMPENSATION

Robert Kenoun, Morton Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1986, Ser. No. 872,345
Int. Cl.[4] G01L *7/08, 9/04, 19/04*
U.S. Cl. 73—708 **14 Claims**



1. A pressure sensing apparatus of the type which automatically compensates for temperature variance, and which may be mounted about a flexible member such that the resistance of one or more strain gauge resistors mounted thereon changes as pressure is exerted upon the flexible member, the pressure sensing apparatus comprising:

pressure sensing means for sensing pressure, said pressure sensing means having:

an input terminal for receiving an input voltage,

at least one first strain gauge resistor mounted on the flexible member,

at least one substantially fixed value resistor having a value based on, at least in part, the rate of change over temperature of said at least one strain guage resistor, and

at least one output terminal at which a voltage is developed which changes as pressure is exerted upon the flexible member; bridge control means coupled to said input terminal; and

an additional strain gauge resistor situated such that it experiences temperature variations which correspond to temperature variations experienced by said first strain gauge resistor, and coupled with said bridge control means such that the voltage at said input terminal is controlled by said bridge control means to compensate for temperature induced variances in said bridge means.

4,798,094

HYDROSTATIC PRIMARY FORCE STANDARD

Donald H. Newhall, Norfolk, Mass.; Charles D. Bullock, Conowingo, and James O. Pilcher, Edgewood, both of Md., assignors to The Unites States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 11, 1988, Ser. No. 142,893
Int. Cl.[4] G01L *1/02, 25/00*
U.S. Cl. 73—862.58 **7 Claims**

1. Apparatus for delivering a precisely determined force to a load, comprising:

a base;

a cylinder having an axis, one end closed by the base, and an opposite open end;

a piston which is slidably disposed within the cylinder for limited movement therein along the cylinder axis, the piston including

an axis,

a loading end which extends from the open end of the cylinder for engagement with the load, and

an opposite inner end having a precise radial leakage clearance with the cylinder when the piston and cylinder axes coincide;

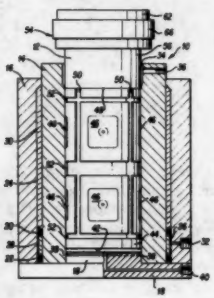
first fluid supply means for supply fluid under a first prese-

lected pressure to the cylinder between the inner end of the piston and the base;

jacketing means for providing an annular cavity extending circumferentially about a portion of the cylinder adjacent the piston inner end;

second fluid supply means for supplying fluid under a second preselected pressure to the annular cavity to contract the cylinder portion radially within the limits of elasticity to maintain the precise radial leakage clearance between the piston inner end and the cylinder; and

piston centering means for maintaining the cylinder and piston axes coincident, including



two axially-spaced circumferential arrays of hydrostatic bearing recesses disposed intermediate the loading end and the inner end of the piston, each array including at least three hydrostatic bearing recesses disposed at equal intervals about the piston circumference, each hydrostatic bearing recess forming with the cylinder a hydrostatic bearing, and

third fluid supply means for supplying fluid under a third preselected pressure to each hydrostatic bearing of the two arrays.

4,798,095

APPARATUS FOR DISTRIBUTING LIQUID SAMPLES AMONG TEST TUBES AND FOR DIVIDING THE TEST TUBES INTO GROUPS

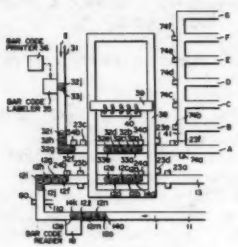
Teruaki Itoh, 5-25, Kogalhonmachi, Kumamoto-shi, Kumamoto-ken, Japan

Filed Apr. 20, 1987, Ser. No. 39,952

Claims priority, application Japan, Apr. 30, 1986, 61-66703[U]; Apr. 30, 1986, 61-66704[U]; Apr. 30, 1986, 61-66705[U]; Apr. 30, 1986, 61-66706[U]; Apr. 30, 1986, 61-66707[U]

Int. Cl.[4] G01N *35/06, 35/04*

U.S. Cl. 73—863.01 **6 Claims**



1. A liquid-distributing apparatus comprising:

a sample-transporting means including holders for holding containers, a conveyor for conveying the holders, and guide means for guiding the holders to a first position where liquid samples will be sucked from some of the containers held by some of the holders, each holder being a hollow cylinder having at least two annular grooves cut in its outer periphery, said guide means having guide edges insertable in the first of said two annular grooves of the holder;

data-reading means for reading, from each of the containers containing a liquid sample, data showing items for which the sample will be analyzed and data showing the identity of the sample;

means for transporting the holders holding empty containers in the same number as the items of analysis to a second position where each liquid sample will be distributed among the empty containers;

means for distributing the liquid sample in small quantities from each of the containers located in said first position, among the containers located in said second position, in accordance with the data read by the data-reading means; and

means for dividing the containers containing the small quantities of the liquid samples into groups in accordance with the data read by the data-reading means.

4,798,096

APPARATUS FOR CHECKING HOLLOW GLASS CONTAINERS

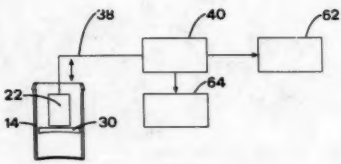
Hans-Ulrich Bogatzki, Zürich, Switzerland, assignor to Elpatronic AG, Switzerland

Filed Sep. 9, 1987, Ser. No. 94,686

Claims priority, application Switzerland, Oct. 10, 1986, 04054/86

Int. Cl.[4] G01N *3/08*

U.S. Cl. 73—12 **2 Claims**



1. An inspection apparatus for large mouth glass containers comprising:

a sensing device movable toward and away from the interior bottom wall of a glass container to be inspected, said device including a housing and a support rod for the housing, means for moving the support rod to position the housing inside a glass container at an inspection position, said device including a pressure plate movably mounted to said housing for limited movement toward and away from said housing, said housing including at least one proximity switch having a sensing face to detect movement of said plate from a normal position towards said housing at least when said device is in its inspection position, said inspection position for said housing and said normal position for said plate providing a positive test for a glass container, said plate movement toward said housing being caused by contact between said plate and a defect in a glass container being inspected, said housing including a sleeve member, a bottom wall for the sleeve member, said proximity switch secured in the bottom wall of the sleeve member so that its sensing face is provided in generally co-planar relationship with the lower face of the sleeve bottom, said pressure plate having a lower face that this contoured to correspond closely to the convex contour of a satisfactory glass container bottom wall to be inspected, said pressure

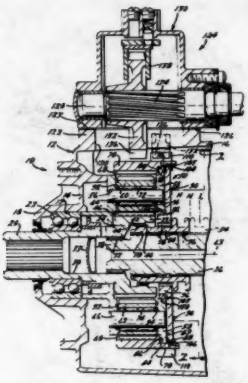
plate provided with a central opening to receive a threaded screw, said screw being received loosely in a bore provided for it in the bottom wall of said housing sleeve, said screw having a head adapted to engage a shoulder on the sleeve bottom to define a normal displacement between the sleeve bottom and the upper surface of the plate.

4,798,097

TRANSFER CASE PLANETARY WITH ANNULUS GEAR POWER TAKEOFF

Richard E. Eastman, Central Square, N.Y., and Anand M. Jagani, Sepulveda, Calif., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 23, 1988, Ser. No. 197,245
Int. Cl.[4] F16H *37/8, 3/44*
U.S. Cl. 74—15.88 2 Claims



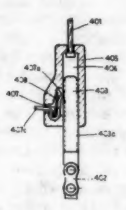
1. In a transfer case apparatus including a housing having an end wall defining an opening, said housing having outer wall means extending in an inboard direction from said end wall, axial bearing means journally supporting an input shaft in said end wall opening, said input shaft having one end terminating within said housing in an annular end flange portion joined by an intermediate stepped radially extending flange portion, said input shaft annular end flange portion formed with external helical gear teeth defining an integral sun gear, an output shaft journally supported in said housing, said output shaft having a clutch collar axially slidable thereon by means of collar internal splines engaged with external splines on said output shaft, said input shaft having an axial counter-bore formed in said input shaft annular end flange, internal clutch teeth formed in said input shaft counter-bore, external clutch teeth formed on said clutch collar slidable engageable with said input shaft counter-bore internal teeth when said clutch collar is moved axially into a high-range drive position, a helical dual planetary gear assembly comprising a carrier having outboard and inboard axially spaced carrier rings, said carrier rings journally supporting first inner and second outer sets of planet pinion gears rotably supported on first and second sets of respective pins journalled between said carrier rings at first and second radial distances, respectively, outward from said central axis, wherein said first distance is a predetermined lesser distance than said second distance, each said first set pinion gear in meshing engagement with said sun gear teeth and each said second set pinion gear in meshing engagement with internal teeth of an annulus gear concentrically disposed around said second set pinion gears, said carrier outboard ring fixed to said housing, said carrier inboard ring extending radially outwardly a predetermined distance beyond said second set of pinion gears, said annulus gear including an axially extending inboard cylindrical extension formed with an internal annular shoulder juxtaposed the outer periphery of said inboard carrier ring, said annulus gear extension formed with internal splines, an annulus plate positioned on the inboard side of said inboard carrier ring having its outer periphery formed with external splines engaged with said annulus gear extension internal splines, said annulus plate formed with a central hub portion extending outboard from said annulus plate, said hub portion having an axial internally splined bore concentrically encircling said clutch collar, said hub portion internally splined bore adapted to be engaged by said clutch collar external splines upon said clutch collar being moved axially to low drive range position, said inboard ring formed with an axial bore encircling said annulus plate hub portion defining an annular clearance therebetween, an annular bushing interposed in said annular clearance concentrically positioning said annulus plate for rotation about the principal axis of said output shaft, said annulus gear extension having external power takeoff helical gear teeth thereon, said housing outer wall means including an aperture radially aligned with said annulus gear power takeoff teeth, mounting means on said outer wall means for supporting a power takeoff gear box unit thereon including an helical toothed power takeoff input gear splined to an axially extending power takeoff shaft, a portion of said takeoff input gear adapted to extend through said housing aperture for axial travel on said takeoff shaft into selective meshing engagement of its helical gear teeth with said annulus gear external power takeoff teeth, whereby with said power takeoff gear in meshing engagement with said annulus gear power takeoff teeth said transfer case input shaft operative, upon being rotated, to transfer power to said power takeoff gear.

4,798,098

CONNECTION DEVICE FOR GEARSHIFT CABLE

Josef Keller, and Werner Steuer, both of Schweinfurt, Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 912,181, Sep. 25, 1986, abandoned, which is a continuation of Ser. No. 529,967, Sep. 7, 1983, abandoned. This application Feb. 4, 1988, Ser. No. 154,501
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233433
Int. Cl.[4] G05G *1/00, 11/00*; F16C *1/10*
U.S. Cl. 74—470 5 Claims



1. A speed change system for a bicycle or the like comprising:

(1) a speed shift member (18), said speed shift member (18) being movable through a plurality of shift member positions responsible for a corresponding plurality of gear ratios;

(2) abutment means (20) defining a basic shift member position of said speed shift member (18);

(3) shift member biasing means (19) urging said speed shift member (18) towards said basic shift member position;

(4) a manually operable switch unit (21) including a switch handle movable through a plurality of handle positions corresponding to said shift member positions, said handle positions including a basic handle position corresponding to said basic shift member position;

(5) a flexible pulling member assembly (1, 2) transmitting motion from said switch handle of said switch unit (21) to said shift member, said pulling member assembly (1, 2) including a first pulling member (1) connected to said switch unit (21) and a second pulling member (2) connected to said speed shift member (18);

(6) a coupling assembly interconnecting said first pulling member (1) and said second pulling member (2), said coupling assembly including

(a) a female coupling unit (5) connected with one of said first and said second pulling members (1, 2) and being provided with an elongated receiving channel (6) having a rectilinear axis extending in the elongated direction and a terminal opening extending transversely of the axis;

(b) a male coupling unit connected with the other (2) of said first and second pulling members (1, 2) and being provided with a male coupling member (3) telescopically movable through the terminal opening into and slidably movable within said receiving channel (6) in the direction of the rectilinear axis thereof;

(c) locking means (7, 3*a*) locking said male coupling member (3) within said receiving channel (6);

(d) manually operable lock releasing means (7*c*) in operative engagement with said locking means for releasing said locking means (7, 3*a*);

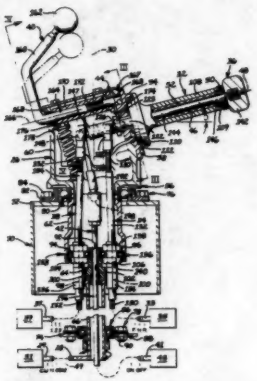
said female coupling unit (5) comprising a housing elongated in the direction of said elongated receiving channel and laterally enclosing the receiving channel in the elongated direction, said housing having a first end and a second end spaced apart in the elongated direction with said second end forming said terminal opening, said male coupling member (3) being telescopically and rectilinearly movable through the terminal opening into said receiving channel (6) along said axis, said male coupling member being axially slidably insertable into said receiving channel without manually operating said lock releasing means, and said male coupling member (3) being movable out of said receiving channel toward the terminal opening of said receiving channel (6) only after manually releasing said lock releasing means (7*c*), said flexible pulling member assembly (1, 2) being tensioned between said speed shift member and said switch unit when said male coupling member (3) is moved into said receiving channel (6) and locked by said locking means (7, 3*a*), said shift member biasing means (19) acting on said speed shift member being of such strength in said basic shift member position of said speed shift member (18) that a considerable expenditure of strength is required acting on said switch unit through said coupling assembly from said first pulling member to said second pulling member for overcoming said shift member biasing means and displacing said speed shift member (18), said locking means (3, 7*a*) comprising a plurality of teeth (3*a*) along said axis on said male coupling member (3) and one single teeth engagement member (7) on said female coupling unit (5), said teeth engagement member (7) being mounted within said housing of said female coupling unit (5) for displacement into and out of engagement with said teeth (3*a*), a biasing spring (8) being housed wholly within said housing of said female coupling unit (5) and biasing said teeth engagement member (7) into engagement with said teeth (3*a*), said lock releasing means in engagement with said teeth engagement member (7) being provided with an unlocking handle (7*c*) extending through an opening in said housing outwardly of said housing, said teeth engagement member (7) and said plurality of teeth (3*a*) acting as a one-way pawl-ratchet system allowing free inward movement of said male coupling member (3) into said receiving channel (6) and locking outward movement of said male coupling member (3) out of said receiving channel (7), a pocket being shaped within the housing of said female coupling unit (5), said pocket being open towards said receiving channel (6) and substantially closed to the exterior of said housing, said pocket receiving said teeth engagement member (7) and said biasing spring (8) with said handle extending outwardly from said pocket through the opening in said housing, said teeth engagement member (7) being established by a bent material strip (7), said bent material strip (7) having a first end (7*a*) for engagement with said teeth (3*a*) and a second end (7*c*) forming said handle (7*c*), an intermediate section of said bent material strip (7) being cylindrically curved, said cylindrically curved intermediate section being in bearing engagement with a cylindrical concave side face of said pocket, said biasing spring (8) being a leaf spring supported by a further side face of said pocket and acting onto said material strip adjacent the first end (7*a*) thereof.

4,798,099

CONTROL MECHANISM FOR OPERATING A VEHICLE

George F. Alexander, Pekin; Alan R. Coutant, Chillicothe; David M. Fee, Groveland, and Craig W. Riediger, Pekin, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 30, 1987, Ser. No. 139,888
Int. Cl.[4] B62D *11/04*; G05G *9/00*
U.S. Cl. 74—473 R **19 Claims**



1. A control mechanism for operating a vehicle having an element mounted on the vehicle for swinging movement about an upstanding first axis, and a tiller arm extending outwardly from the element along a second axis and controlling steering of the vehicle by swinging the element about the first axis, comprising:

first actuator means for controlling the direction of longitudinal movement of the vehicle including a directional actuating member; and

second actuator means for controlling the speed range of the vehicle including a speed actuating member, the directional and speed actuating members being arranged on the tiller arm for independent rotation about the second axis.

4,798,100

AUTOMATIC ADJUSTMENT DEVICE FOR CABLE CONTROL SYSTEMS

John M. Baumgarten, Saline, Mich., assignor to Babcock Industries Inc., Fairfield, Conn.

Filed Sep. 18, 1987, Ser. No. 98,235
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501.5 R **6 Claims**

1. An automatic control device for cable control systems comprising

a first member adapted to be fixed,

a second member adapted to be connected to a conduit of a cable control system,

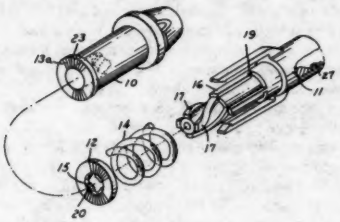
a third member interposed between the first and second members,

means between said first member and said third member defining a one-way clutch,

spring means interposed between said third member and said second member,

said second member including circumferentially spaced helical teeth that engage complementary grooves in said first member,

said second member further including circumferentially spaced longitudinally extending ribs having ends aligned



with ends of the helical teeth wherein said ribs engage circumferentially spaced grooves of said third member,

such that when the device is released, the force of the spring means urges the second member axially away from the first member and the one way clutch permits the second member to rotate relative to the first member in one direction only and prevents the second member from moving axially inwardly relative to said first member.

4,798,101

CORE MATERIAL FOR STEERING WHEELS MADE OF LONG FIBER-REINFORCED RESIN

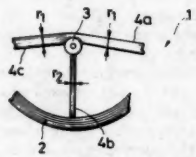
Yasushi Yamazawa; Masaki Terada, and Yasuhiro Tsuchiya, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 29, 1987, Ser. No. 8,255

Claims priority, application Japan, Jan. 30, 1986, 61-11963[U]

Int. Cl.[4] B62D *1/04*

U.S. Cl. 74—552 **9 Claims**



1. A steering wheel core, comprising:

a boss portion adapted to be connected to the upper end of a steering column;

a ring portion spaced upwardly from the upper end of said boss and steering column, said boss portion being centrally disposed relative to said ring portion;

first, second and third radial spoke portions extending at respective projection angles to the axis of said boss portion and said ring portion and connecting said boss portion to said ring portion,

said first and third spoke portions being angularly spaced from each other at a selected radial angle,

said second spoke portion being spaced at a radial angle intermediate said first and third spoke portions,

said first, second and third spoke portions including resin reinforced fibers wound to form each said spoke portion to have a selected cross-sectional area,

said selected cross-sectional area of said resin reinforced fibers of said second spoke portion having a maximum cross-sectional area less than a minimum cross-sectional area of said resin reinforced fibers of said first and third spoke portions for causing said second spoke portion to deform in a direction to change the projection angle between said second spoke portion and the axis of said boss and ring portions more readily than the projection angles between said first and third spoke portions and the axis of said boss and ring portions in response to downward pressure on said ring portion substantially central of said first and third spoke portions.

4,798,102

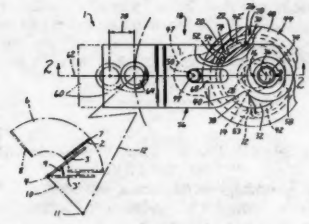
CRANK ARM ASSEMBLY FOR WINDSHIELD WIPER DEVICE

Jeffrey J. Buschur, Beavercreek; David R. Paulick, Kettering, and Roy C. Schoen, West Milton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 21, 1987, Ser. No. 52,478

Int. Cl.[4] B60S *1/24*

U.S. Cl. 74—600 **3 Claims**



1. In combination with an electric motor including a motor shaft supported on a housing of said motor for rotation in opposite first and second directions about a main axis of said motor, a crank arm assembly comprising:

means defining a crank pin rotatable as a unit with said motor shaft in a circular inside orbit around said main axis,

a control member supported on said housing for rotation about said main axis independently of said motor shaft,

an intermediate link disposed in a plane perpendicular to said main axis and pivotally connected at one end to said crank pin and including a link ball rigidly connected thereto at the other end,

means on said intermediate link and on said control member defining a slidable pivot fulcrum therebetween located between said ends of said intermediate link,

said intermediate link having a folded position relative to said motor shaft defined by linear alignment of said link ball and said crank pin and said main axis with said link ball and said crank pin on opposite sides of said main axis,

said intermediate link having an unfolded position relative to said motor shaft defined by linear alignment of said link ball and said crank pin and said main axis with said link ball and said crank pin on the same side of said main axis,

said crank pin being operative when said control member is immobilized relative to said housing and in response to rotation of said motor shaft in either of said first and said second directions through substantially 180 degrees to move said intermediate link between said folded and said unfolded positions,

means defining a drive lug rotatable as a unit with said crank pin and engageable on said intermediate link in said folded position of said intermediate link when said motor shaft rotates in said first direction whereby said intermediate link is captured between said crank pin and said drive lug and rotated as a unit with said drive lug and said crank pin

about said main axis so that said link ball traverses a circular outside orbit around said main axis,

means on said motor housing defining an inner cylindrical wall centered around said main axis, hub means on said motor shaft defining an outer cylindrical wall centered on said main axis and rotatable as a unit with said motor shaft, said inner and said outer cylindrical walls defining an annular space therebetween centered around said main axis,

a coil torsion spring disposed in said annular space and including a first hook-like formation at one end and a second hook-like formation at the other end angularly spaced from said first hook-like formation,

said spring having an unflexed condition frictionally engaging said inner cylindrical wall and a flexed condition remote from said inner cylindrical wall,

means defining a skirt on said control member disposed between said first and said second hook-like formations, and

means on said hub means defining a tang engageable on said first hook-like formation of said spring when said motor shaft rotates in said first direction and operative to torsionally flex said spring to said flexed condition and separable from said first hook-like formation at the onset of rotation of said motor shaft in said second direction so that said spring torsionally unflexes to said unflexed condition and thereby immobilizes said control member by capturing said skirt between said first and said second hook-like formations.

4,798,103

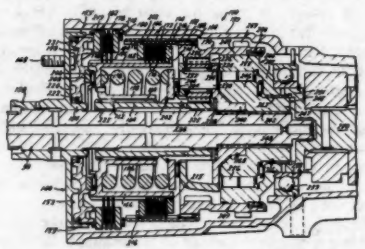
AUTOMATIC TRANSMISSION WITH ADD-ON OVERDRIVE

Richard E. Eastman, Central Square, and Stewart J. Woodcock, Fayetteville, both of N.Y., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Continuation of Ser. No. 7,871, Jan. 28, 1987, abandoned. This application Dec. 11, 1987, Ser. No. 133,159

Int. Cl.[4] F16H *37/04*

U.S. Cl. 74—740 **2 Claims**



1. An overdrive unit for use with an automatic transmission, said transmission having an extended output shaft extending rearwardly therefrom through the forward open end of an overdrive outer casing and aligned on the longitudinal axis thereof, said overdrive unit comprising:

a planetary gear set concentrically disposed about said longitudinal axis and including a sun gear, an annulus gear and a carrier with fore and aft carrier rings supporting a plurality of planetary pinion gears in meshing engagement with said sun gear and said annulus gear, said aft carrier ring concentrically engaged with the transmission output shaft;

a one-way clutch including inner and outer concentrically disposed races with coupling means located therebetween, said one-way clutch positioned rearward of said aft carrier ring, said annulus gear having a rearwardly projecting portion surrounding a portion said outer race concentrically engaged therewith;

said inner race concentrically engaged with the transmission output shaft and said outer race concentrically engaged with an overdrive output shaft disposed coaxial with the transmission output shaft;

an outer sleeve surrounding a forward portion of said annulus gear and concentrically engaged therewith;

an inner sleeve concentrically journalled on said transmission output shaft, said inner sleeve having a rearwardly extending portion formed with external gear teeth defining said planetary gear set sun gear;

clutch spool means located forward of said fore carrier ring and concentrically disposed intermediate said inner and outer sleeves, compression spring means located in axial compression between said spool means and abutment means fixed said inner sleeve;

a first direct-drive clutch pack adapted for coupling said outer sleeve to said spool means;

a second overdrive clutch pack adapted for coupling said overdrive casing to said spool means;

a bulkhead sealingly enclosing said casing forward open end, said bulkhead defining a concentrically disposed annular cylinder on its rearwardly facing portion, a central piston slideably received in said cylinder operative when said cylinder is pressurized to be stroked rearwardly, said piston moving said spool means rearwardly thereby compressing said spring means;

said spring means operative to normally bias said spool means forwardly engaging said first direct drive clutch pack and disengaging said second overdrive clutch pack locking said outer and inner sleeves together wherein the driving torque of the transmission output shaft is delivered to said one way clutch inner race thus coupling said inner race to said outer race for direct drive of said overdrive output shaft obviating torque transfer through said direct drive clutch pack;

whereby upon said cylinder being pressurized said piston is stroked rearwardly compressing said spring means thereby disengaging said first direct drive clutch pack and engaging said second overdrive clutch pack, wherein said annulus gear is free to rotate relative to said inner sleeve and said sun gear teeth allowing said outer race to overdrive said inner race uncoupling said one-way clutch such than an overdrive gear ratio is transmitted from the transmission output shaft to said planetary gear set aft carrier ring, said planetary gears, and thence via said annulus gear and said outer race to said overdrive output shaft; and

said clutch spool means in the form of a dual walled clutch spool having cylindrical outer and inner walls concentric with said transmission output shaft, said outer and inner walls connected at their forward ends by a radially extending base wall, and said spring means in the form of a single coil compression spring concentrically disposed about said transmission output shaft intermediate said spool outer and inner walls so as to be compressed between said spool base wall and said abutment means fixed to said inner sleeve.

4,798,104

OSCILLATORY TOOTH AND NEEDLE GEAR TRANSMITTING DEVICES

Shixian Chen, 68 Xiao Wei St.; Hung S. Wang, 37 Xue Yuan Rd., and Linai Chang, 227 Nan Xiao St., all of Beijing, China

Continuation-in-part of Ser. No. 850,726, Apr. 11, 1986, abandoned. This application Oct. 30, 1987, Ser. No. 115,047

Claims priority, application China, Apr. 12, 1985, 85200606

Int. Cl.[4] F16H *1/28*

U.S. Cl. 74—804 **19 Claims**

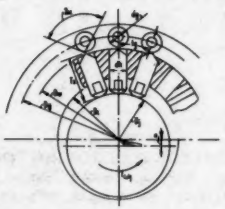
1. An oscillatory tooth and needle gear transmitting device comprising three basic components:

a wave-actuator J including an eccentric disk,

an oscillatory tooth wheel H including a wheel body defining holes therein and a set of oscillatory teeth which reciprocate substantially radially in the holes, said wheel

body and oscillating teeth assembled together in an oscillatory tooth disk, said wheel body surrounding the eccentric disk so that the is positioned to engage the oscillating teeth at their inward end to reciprocate the teeth in forward and backward strokes, and

a stationary needle gear G including an annular needle tooth frame and a set of needle teeth fitted circumferentially onto the needle tooth frame, said needle teeth being distributed evenly defining a pitch t_g, the radially outward end of the oscillating teeth for engaging the needle teeth in order to accomplish motion and power transmission;



wherein the relationship between the width of said oscillatory teeth d_h, the diameter of said needle teeth d_g and the pitch of said needle teeth t_g is

$$d_h > t_g - d_g;$$

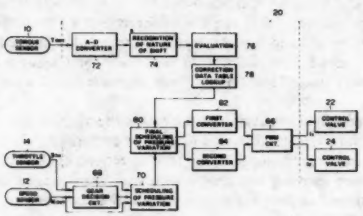
providing continuous transmission with constant speed ratio for the wave-actuator, the tooth wheel and the needle gear and the forward and backward strokes of the oscillating teeth are achieved by the meshing between tooth profiles of said oscillatory teeth and needle teeth.

4,798,105

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION PRODUCING SHOCK-FREE SHIFT

Sadao Takase; Hitoshi Takeda, both of Yokohama, and Osamu Isobe, Omiya, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Aug. 18, 1986, Ser. No. 897,475
Claims priority, application Japan, Aug. 16, 1985, 60-180156
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—866 **11 Claims**



1. A control system for an automatic transmission, comprising:

torque sensor means for detecting an output shaft torque of the automatic transmission which varies in a pattern in effecting shifting in the automatic transmission;

a control unit including means for recognizing the pattern of variation of the output shaft torque detected by said torque sensor means, means for evaluating the pattern of variation recognized, and means for determining a variation of fluid pressure to be supplied to a friction element in response to the result of the evaluation of the pattern of variation recognized; and

means for regulating a fluid pressure supplied to said friction element in response to said variation of fluid pressure determined,

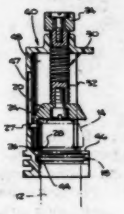
whereby said fluid pressure supplied to the friction element is appropriately adjusted to alleviate substantial shift shock in effecting the same shifting by said friction element subsequently.

4,798,106

CHAMPAGNE BOTTLE CORK PULLER AND INSERTING APPARATUS

Milton E. Foster, 2735 Almendra Ct., Fallbrook, Calif. 92028

Filed Dec. 12, 1986, Ser. No. 941,206
Int. Cl.[4] B67B *7/02*
U.S. Cl. 81—3.29 **4 Claims**



1. A champagne bottle cork puller and inserting apparatus comprising:

engaging means for engaging a champagne bottle cork, said engaging means including a semicircular shell defining a first opening adapted to engage the head of said cork, said shell also including a ridge defining a second opening adapted to engage the stem portion of said cork, and pin means, attached to said engaging means and adapted to slide along a body means, for maintaining said first and second openings exposed;

means, concentrically positioned and attached to said engaging means, for raising and lowering said engaging means; and

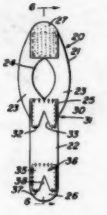
body means for engaging said bottle and said raising and lowering means, said body means including a single part body including a groove which is adapted to securely fit around a champagne spout rim.

4,798,107

NAIL HOLDING ATTACHMENT FOR A HAMMER

Thomas Furey, 218 Middlesex Ave., Voorhees, N.J. 08043

Filed May 8, 1987, Ser. No. 47,266
Int. Cl.[4] B25C *1/00*
U.S. Cl. 81—23 **7 Claims**



1. A nail holding attachment for a hammer having an elongate handle and a transverse head, said attachment comprising a closed loop of stretchable elastic fabric engageable about a

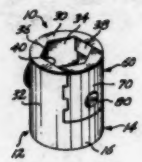
hammer handle coaxially with the handle, a strap having one end connected to said loop for extension therefrom over the hammer head, fastener means connecting the other strap end to said loop, and at least one nail head receiver on said strap for hoding a nail to be started.

4,798,108

ADJUSTABLE SOCKET-FORMING DEVICE

Dennis W. Wilson, Sumner, Wash., assignor to Designs Unlimited, Inc., Federal Way, Wash.

Filed Apr. 30, 1984, Ser. No. 605,467
Int. Cl.[4] B25B *13/16*
U.S. Cl. 81—170 **5 Claims**



1. An adjustable socket-forming device, comprising:

a body comprising a base adapted for connection to a source of rotary motion and a fixed gripping member having the approximate form of a hollow cylinder having a portion of one side removed, the interior surface of the hollow cylinder being shaped so as to define a first pair of faces and a pair of mutually parallel side faces disposed on opposite sides of the first pair of faces;

a movable gripping member shaped so as to define a second pair of faces, the movable gripping member being slidably mounted between the side faces for movement along a first direction towards and away from the first pair of faces, the side faces and the movable gripping member including means for mounting the movable gripping member between the side faces for sliding movement along the first direction; and

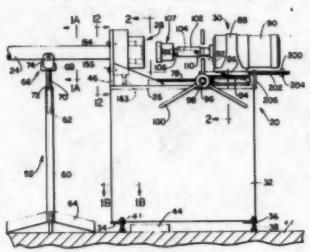
means for securing the movable gripping member at a selected position with respect to the body, to thereby form a socket of a selected size between the groups of faces.

4,798,109

MACHINE FOR FORMING A CHAMFERED EDGE ON A WORKPIECE

Joseph F. Berns, 1171 Georgia Lane, Cincinnati, Ohio 45215

Filed Sep. 23, 1987, Ser. No. 100,013
Int. Cl.[4] B23B *3/00*
U.S. Cl. 82—2 R **4 Claims**



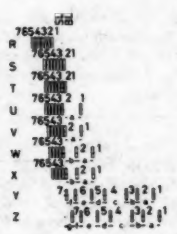
1. A machine for forming a chamfer on an end portion of a workpiece which comprises a table, a chuck having an axis and mounted on the table for holding a selected portion of the workpiece in symmetrical relation to said axis with an end portion of the workpiece supported in position for chamfering, track means mounted on the table and extending parallel to the axis of the chuck, a carriage running on the track means, a motor carried by the carriage, a cutter head driven by the motor, cutter blade means mounted on the cutter head, the axis of the cutter head being aligned with the axis of the chuck, a first guide ring on the chuck, a second guide ring on the cutter head, the first and second guide rings being engageable for maintaining axes of the cutter head and the chuck in alignment as the carriage moves, and means for moving the carriage, the motor and the cutter head toward the chuck whereby the cutter blade means forms a chamfer on the workpiece having an axis coincident with the aligned axes of the cutter head and the chuck.

4,798,110

METHOD FOR POSITIONING TOOLS

Masateru Tokuno, Hyogo; Tetsuya Sawata, Kyoto, and Yasuharu Mori, Hyogo, all of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Filed Nov. 4, 1981, Ser. No. 318,042
Claims priority, application Japan, Nov. 13, 1980, 55-160317; Feb. 24, 1981, 56-27377; Sep. 1, 1981, 56-138095
Int. Cl.[4] B26D *7/26*; G05B *19/28*; B23D *19/06*
U.S. Cl. 83—13 **11 Claims**



1. A method for positioning tools selectively in apparatus having a plurality of movable tools, a stand-by reach for storing the tools, a positioning reach in which the tools are selectively and operatively positioned and an origin located between said stand-by and positioning reaches, in which method the tools are aligned in the stand-by reach in a row extending from the origin and then a selected number of the aligned tools are advanced into the positioning reach and positioned at selectively spaced locations therein, characterized by the steps of

(a) successively moving to the origin the aligned tool in the stand-by reach disposed nearest to the origin,

(b) temporarily stopping the tool so moved at the origin,

(c) then moving the tool which had been moved to and stopped at the origin into the positioning reach by a selected distance,

(d) said selected distance being equal to a desired distance between the tool so moved from the origin and the next successive aligned tool in the stand-by reach, and

(e) as each successive tool from the stand-by reach is moved from the origin into the positioning reach by its selected distance, simultaneously advancing tools previously positioned in the positioning reach by a distance equal to said selected distance by which the said successive tool is moved from the origin, whereby all tools in the positioning reach are maintained at selected distances from each other as successive tools are moved into the positioning reach.

4,798,111

SOCKET-WRENCH HAND TOOL

Charles D. Cheeseman, 18 S. Maple St., Greens Fork, Ind. 47345

Filed Aug. 3, 1987, Ser. No. 81,030
Int. Cl.[4] B25B *23/16*
U.S. Cl. 81—124.4 14 Claims

1. A hand tool for applying rotational torque to a work object, comprising, in combination:

a shank member having an inner end and an outer end substantially spaced apart;

a handle member for the shank member;

connection means connecting the handle member and the shank member adjacent the inner end of the shank member;

a plurality of socket members, each having a hollow bore, adapted to be sleeved onto and carried by the shank member in a series arrangement on the shank member;

the shank member being provided adjacent its outer end with a releasable connector means but devoid of any abutment at or adjacent the shank member's outer end which would prevent passage of the socket members onto and along the shank member, the shank member thus permitting all of the socket members to be manually pushed onto the shank member and into said series arrangement sleeved thereupon by entrance onto the shank member's outer end and relatively moved along the shank member toward the shank member's inner end, and with all of the socket members except the outermost one, which is the one to be used for torque-application effect, having been ensleevedly moved along said shank member and past the shank member's releasable connector means;

the shank member being provided with an outwardly-facing abutment means blocking movement of a socket member inwardly thereof, and defining a specific distance between the shank member's releasable connector means and the shank member's abutment means;

the length of the said socket members being operatively uniform, and such that the total length of all the socket members, minus one-half of a length of one of the socket members, is generally equal to the said specific distance between the shank member's releasable connector means and shank member's abutment means;

each of the socket members being provided with a releasable connector means "located centrally within the socket member" and co-operative with the shank member's releasable connector means to releasably retain the outermost one of the socket members from freely moving outwardly of the shank member "forming a releasable connection therebetween";

rotation-blocking means operable between the outer end of the shank member and the outermost socket member to provide that as the user applies rotational torque to the handle member, the torque, as will be then transmitted to the shank member by the connection means which connect the handle member to the shank member, will be transmitted to the outermost socket member;

the shank member's abutment means providing a means for the transmission of axial force through all of the socket members carried on the shank member, by its engagement with the innermost one of the socket members, all the socket members thus being active in such force transmission;

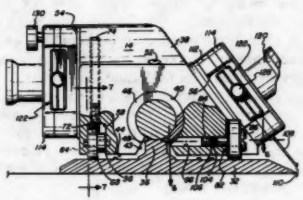
and said releasable connection formed between the shank member's releasable connector means and the outermost socket member's releasable connector means being too weak to retain the outermost socket member from being forced inwardly toward the handle member by the reaction by the work object against the axial force applied to the shank member by the user in using the tool, that retention being wholly by force transmission operative from the said abutment means and through the socket members including and inwardly of the outermost socket member as are carried on the shank member.

4,798,112

HEAD ASSEMBLY FOR MAT CUTTING MACHINE

Vincent T. Kozyrski, Plainville, and Alan R. Peters, Milford, both of Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.

Continuation-in-part of Ser. No. 13,578, Feb. 11, 1987. This application Nov. 20, 1987, Ser. No. 123,397
Int. Cl.[4] B26D *7/26*
U.S. Cl. 83—455 19 Claims



1. A head assembly for a mat cutting machine, comprising: a body having a bottom surface with at least one planar area thereon, a rectilinear channel extending from end-to-end through said body and opening on said bottom surface along the entire length thereof, a first surface portion along one side of said body disposed at an acute angle to said planar area and extending substantially parallel to the axis of said channel; a first wheel subassembly including a first wheel, and first means for mounting said first wheel on said body for rotation about an axis perpendicular to said channel axis, with at least a rim portion of said first wheel extending beyond said bottom surface at a location adjacent said one side of said body, said first mounting means including an axle member mounted for pivoting on an axis perpendicular to said channel axis, and locking means for securing said axle member in each of a multiplicity of angularly displaced positions pivoted on said axis of pivoting, said axle member having a support portion for supporting said first wheel for rotation about an eccentric axis parallel to said axis of pivoting and offset therefrom, the amount of such first wheel rim portion extension thereby being variable by pivoting of said axle member about said axis of pivoting, both said axle member and also said locking means being disposed on said body so as to permit ready access, for convenient manipulation thereof; and a second wheel subassembly, including a second wheel and second means for mounting said second wheel on said body for rotation about an axis perpendicular to said channel axis, with at least a rim portion of said second wheel extending beyond said bottom surface at a location

spaced to the opposite side of said channel opening from said one side of said body, said second mounting means being adapted to permit variation of the amount of such second wheel rim portion extension.

4,798,113

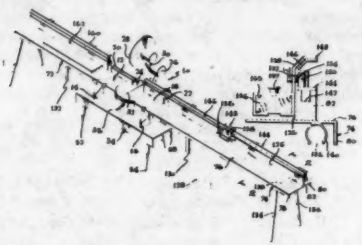
EXTENSION TABLE APPARATUS FOR POWER SAW

John P. Viazanko, 15034 Chase St., Sepulveda, Calif. 91343

Filed Apr. 14, 1986, Ser. No. 851,712

Int. Cl.[4] B27B *5/18*

U.S. Cl. 83—471.3 **35 Claims**



1. An extension table apparatus for a power saw having a table and a fence, comprising:

a base;

power saw mounting means on said base for supporting a power saw thereon;

extension table mounting means on the power saw table and for demountably interengaging with an extensions table, engagement means on the power saw fence;

an extension table demountably mounted on said extension table mounting means for demounting with respect thereto and mounting with respect to said mounting means on both the saw table, a fence on the extension table for detachable engagement with said engagement means of the power saw fence;

wheels on said base for providing transport for said base from one site to another; and

demountable legs on said base for supporting said base above the floor in a position where said wheels are above the floor so that said legs can be demounted so that said base can rest on its wheels.

4,798,114

CUTTING UNIT FOR A MEAT SLICING APPARATUS

Juergen Hager, Hueckeswagen; Walter Vieth, Wermelskirchen, and Werner Manderla, Remscheid, all of Fed. Rep. of Germany, assignors to Magurit Gefrierschneider GmbH, Remscheid-Lennep, Fed. Rep. of Germany

Filed May 21, 1987, Ser. No. 52,948

Claims priority, application Fed. Rep. of Germany, May 22, 1986, 8613821[U]

Int. Cl.[4] B26D *1/09*

U.S. Cl. 83—522 **11 Claims**

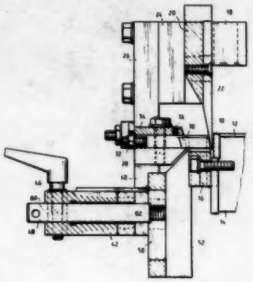
1. An apparatus for cutting meat into strips comprising:

a substantially horizontal table for supporting a meat block to be cut, said table having an end edge forming a counter cutting edge,

a cutting unit mounted relative to said table so as to be reciprocable along a path extending substantially vertically and including:

a main blade having a cutting edge extending substantially parallel to said counter cutting edge and a plurality of transverse blades having cutting edges extending substantially transverse to said main blade cutting edge and at a side thereof facing away from said table end edge,

said apparatus further comprising a stationary slice support mounted adjacent said table and beneath said transverse blades, said slice support having a plurality of projections extending outwardly away from said table defining a plurality of gaps along said slice support into which said transverse blades extend as said cutting unit reciprocates



along its vertical path toward and away from its lowermost position, said cutting unit further including a stop assembly having a plurality of stop elements confronting said gaps and displaceable in a substantially horizontal direction so that each stop element engages an allocated gap.

4,798,115

PNEUMATIC DRIVE FOR PUNCHING, CUTTING AND STAMPING DEVICES

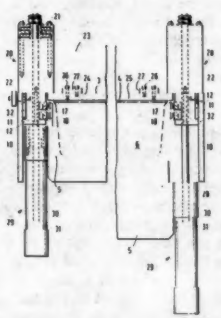
Alfred Schmeck, Biedenkopf, Fed. Rep. of Germany, assignor to Kraemer & Grebe GmbH & Co. KG Maschinenfabrik, Biedenkopf-Wallau, Fed. Rep. of Germany

Filed Jun. 5, 1987, Ser. No. 58,469

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1986, 3619811

Int. Cl.[4] B26D *5/12, 5/04*

U.S. Cl. 83—639 **13 Claims**



1. In a pneumatic drive for punching, cutting and stamping devices comprising two tool parts which can be relatively moved toward and away from one another and of which at least one of said tool parts is fixedly connected to a machine frame, the improvement wherein at least one pneumatic cylinder is secured on a movable tool part, wherein a first piston rod is provided in said pneumatic cylinder, wherein a locking means is provided for locking said first piston rod in at least one end position thereof to said pneumatic cylinder, wherein at least one pressure clamping element is provided which has a

second piston rod secured to said first piston rod exiting from said pneumatic cylinder, said pressure clamping element consisting of at least two piston cylinder units operatively connected with said second piston rod, said piston cylinder units including a fluid circuit means connecting said piston cylinder units in series so that an additive force is outputted on said second piston rod, whereby when said first piston rod is locked in said one end position, said piston cylinder units can be activated by supplying fluid to said fluid circuit means to cause said additive force to be outputted to said second piston rod, thereby causing said first piston rod, which is locked to said pneumatic cylinder, and said movable tool part, which is connected to said pneumatic cylinder, to be moved together toward said fixed tool part.

4,798,116

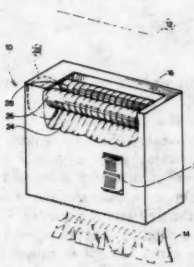
DOCUMENT SHREDDING MACHINE

Marc L. Silver, 1418 W. Princeton La., Schaumburg, Ill. 60193, and John Pizzolato, 1017 Rene Ct., Park Ridge, Ill. 60068

Continuation-in-part of Ser. No. 93,049, Sep. 4, 1987, abandoned. This application Apr. 22, 1988, Ser. No. 186,769

Int. Cl.[4] B02C *19/12*; B26D *1/03*

U.S. Cl. 83—858 **17 Claims**



1. A document shredding machine comprising:

a frame member;

first and second engaging conveyor rollers rotatively mounted to said frame member and having a plurality of paired transverse slits defined therein;

means for driving said rollers; and

cutting means fixed to said frame member and protruding through said slits in said rollers and arranged to present a cutting edge proximate the point of engagement of said rollers, whereby documents are conveyed by said rollers past said cutting means to cause shredding.

4,798,117

METHOD OF PRODUCING BRICK-LIKE FACING ELEMENTS

Jan U. Aronsson, Vaxjo, Sweden, assignor to Hegri, B.V., Arnhem, Netherlands

Continuation of Ser. No. 741,700, Jun. 6, 1985, abandoned. This application Nov. 5, 1987, Ser. No. 117,471

Claims priority, application Sweden, Jun. 6, 1984, 8403035

Int. Cl.[4] B27F *1/18*

U.S. Cl. 83—870 **2 Claims**

1. A method of producing facing elements comprising the steps of providing a piece of particle board the length and width dimensions of which correspond with the same of a brick having generally parallel sides, locating said piece of particle board between two cutting tools, moving one of said cutting tools towards the other cutting tool to split the particle

board along a plane parallel to its sides into two facing elements having rough brick-like surface.

4,798,118

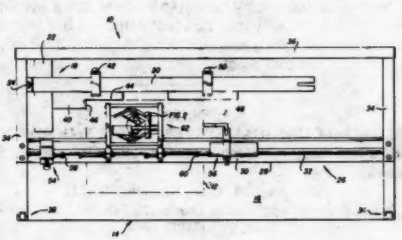
APPARATUS FOR CUTTING V-GROOVES IN MATS

Charles H. Carithers, Jr., 5752 A Gallant Dr., Jackson, Miss. 39239

Filed Feb. 26, 1988, Ser. No. 161,042

Int. Cl.[4] B26D *3/06*; B27M *1/00*

U.S. Cl. 83—875 **25 Claims**



1. An apparatus for cutting V-grooves in a mat board or the like comprising:

a flat base;

a positioning means for positioning the mat board on said base;

a cutting unit, said cutting unit including

(a) a frame,

(b) a pair of cutting blade holders, each said blade holder having a cutting blade positioned therein with an exposed tip, and

(c) a holder moving means attached to said frame for moving said blade holders between lowered position relative to said frame where said tips are adjacent one another while planes of said blade intersect at the tips to form a V-pattern and a raised position relative to said frame;

a guide mounted to said base adjacent said positioning means; and

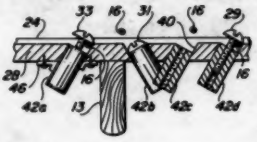
a frame mounting means for mounting said frame of said cutting unit for precise movement along said guide whereby a V-groove is precisely cut in the mat board positioned by said positioning means when said cutting unit is moved along said guide and said holder moving means is moved to the lowered position where said tips engage the mat board.

4,798,119

FIXED FINGERING DEVICE FOR FRETTED STRINGED MUSICAL INSTRUMENT

Eric S. Leifheit, 7541 E. 34th St., Tucson, Ariz. 85710

Filed Oct. 27, 1987, Ser. No. 113,053
Int. Cl.[4] G10D *3/14*
U.S. Cl. 84—314 R **7 Claims**



1. On a fretted stringed musical instrument having a vibrational length of string stretched between two points overlying a plurality of frets on the instrument fretboard surface, a positioner mechanically fingering the string to selectively vary the string vibrational pitch comprising:

means to secure the string at a selected position to selectively vary the vibrational length of the string, said means including an insert fixedly attached to the fretboard of the stringed instrument proximate the string, said insert having a central threaded opening therethrough, said threaded opening angled at an angle less the 90-degrees with respect to said fretboard; and

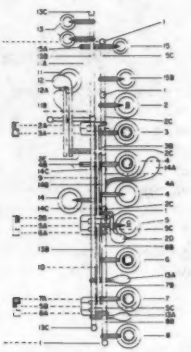
a machine screw threadably received by said insert threaded opening, said machine screw having a head with an underside, said machine screw adapted to secure the string in a locked downward "V" catch to hold the string against the fretboard whereby the pitch of the string, when vibrating, may be selectively changed from the pitch it vibrates at between the two points.

4,798,120

BöHM MECHANICAL SYSTEM FOR A WOODWIND

Luthier J. Brögger, Stoltenbergsgade 1, 1576 Copenhagen, Denmark

Filed Aug. 18, 1986, Ser. No. 897,215
Claims priority, application Denmark, Jan. 6, 1986, 36/86
Int. Cl.[4] G10D *9/04*
U.S. Cl. 84—380 R **1 Claim**



1. In a Böhm-system for a woodwind instrument having rotating fixed keys movable in a rocking motion on the instrument body the improvement comprising,

a fixed nonrotating main axle mounted on the instrument body,

said keys being rotatably mounted upon said fixed nonrotating main axle,

first and second coupling rods parallel to said main axle interconnecting some of the keys for transferring rocking movement from one key to another,

tubular charniers rotatably mounting said keys upon said main axle,

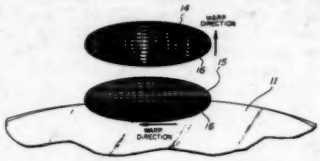
and a plurality of like loop clutches fitted to said tubular charniers for transferring rocking motions to said keys mounted on said main axle from other keys mounted on said instrument body.

4,798,121

IMPACT RESISTANT DRUMHEAD

David G. Donohoe, Springville, Calif., assignor to Aquarian Accessories Corporation, Anaheim, Calif.

Filed May 27, 1987, Ser. No. 54,840
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—414 **27 Claims**



1. A head for drums and related percussion instruments comprising:

(a) a circular base sheet,

(b) a first, lower overlay sheet of woven synthetic plastic material, said overlay sheet having a circular shape of substantially smaller diameter than said base sheet and adhered to the upper impact surface of said base sheet at the geometric center thereof, and

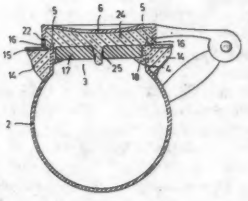
(c) a second, upper overlay sheet of woven synthetic plastic material, said upper overlay adhered concentrically within the perimeter of said lower overlay sheet in a cross-laminated relationship to said lower overlay sheet, with the woof directions of said first and second overlay sheets oriented at an angle with respect to one another.

4,798,122

WIND INSTRUMENT AND PROCESS OF MAKING SAME

Barbara Gisler, Mauerbach, and Werner Tomasi, Vienna, both of Austria, assignors to Walter Wretschitsch, Vienna, Austria, a part interest

Filed Oct. 3, 1986, Ser. No. 893,547
Claims priority, application Austria, Dec. 4, 1984, 3850/84; Dec. 4, 1984, 3849/84
Int. Cl.[4] B29C *43/18*; G10D *9/04*
U.S. Cl. 84—385 P **27 Claims**



9. A process for the manufacture of a wind instrument that

has at least one pitch-determining hole and a key for selectively closing the hole, comprising:

(a) inserting a disk into the key, the disk being provided on its front with a flexible covering and having a space therebetween;

(b) placing a plastic compound into the space between the disk and the flexible covering before or after the insertion of the disk into the key, the plastic compound being capable of solidifying to form a nonrigid elastic plastic;

(c) applying the key to the hole to close the hole;

(d) allowing the plastic compound to solidify, whereby the elastic plastic forms a seal inlay within the key which is applied against the rim of the hole when the key is in the closed position.

20. A wind instrument comprising:

(a) at least one pitch-determining hole;

(b) a key for selectively closing the hole; and

(c) a seal inlay provided within the key for contacting the rim of the hole when the key closes the hole,

wherein the inlay comprises a disk provided with a flexible covering and a pad layer made of plastic that is hardened in situ between the flexible covering and the disk, and

wherein the flexible covering is attached to the disk on at least one of its front rim, its circumferential face, and on its side facing away from the pad layer.

4,798,123

MAGAZINES

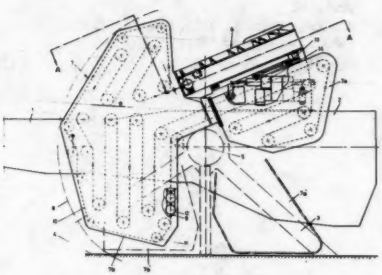
Rune Svanström, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Apr. 10, 1987, Ser. No. 37,304

Claims priority, application Sweden, Apr. 10, 1986, 8601605

Int. Cl.[4] F41D *10/22*

U.S. Cl. 89—34 **9 Claims**



1. In a rapid-fire automatic gun a magazine apparatus comprising:

a first magazine for a substantially small number of rounds;

a second magazine for a substantially large number of rounds;

a first round advancement means for advancing said rounds in said first magazine, said first means being controlled by the automatic gun such that the round advancement speed in said first magazine is dependent upon rate of fire of the automatic gun;

a second round advancement means for advancing rounds in said second magazine;

a driving means for driving said second round advancement means at a maximum speed smaller than the maximum round advancement speed in said first magazine;

a transfer means for transferring rounds from said second magazine to said first magazine, said transfer means being adapted to provide formation of a gap in the row of rounds being advanced in said first magazine when a difference occurs in the advancement speeds in said first and second magazines, said transfer means including a packing member having a plurality of inclined surfaces for cooperation with respective rounds,

a round grasping means located adjacent the breech of the automatic gun for grasping each respective round from a predetermined advancement position and transferring said round to a ramming bay; and

a disabling means for disabling said round grasping means during advancement of said gap in the row of round in said first magazine.

4,798,124

GAS REMOVAL APPARATUS FOR AN AUTOMATIC FIRING WEAPON CONTROLLED BY THE GAS PRESSURE

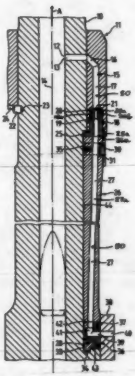
Ernst Hürlemann, Zurich, and Hans Häfeli, Döttingen, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Mar. 16, 1987, Ser. No. 26,304

Claims priority, application Switzerland, Mar. 20, 1986, 01 121/86-9

Int. Cl.[4] F41D *5/04*

U.S. Cl. 89—193 **17 Claims**



1. A gas removal apparatus for an automatic firing weapon controlled by gas pressure, comprising:

a weapon barrel having an outer surface and a lengthwise axis;

said weapon barrel being provided with a gas removal location;

a weapon housing;

said weapon barrel being replaceably secured in said weapon housing;

a gas receiving channel provided in said weapon housing;

said gas removal location provided for said weapon barrel being positioned, as viewed in the direction of the lengthwise axis of the weapon barrel, at a distance upstream of said gas receiving channel in said weapon housing with respect to a predeterminate direction of gas flow between the gas removal location and the gas receiving channel;

an outwardly-open groove provided at said outer surface of said weapon barrel and extending in the longitudinal direction of said weapon barrel between said gas removal location and said gas receiving channel;

a gas rail having oppositely situated ends and arranged in said outwardly-open groove;

said gas rail being held at said oppositely situated ends in said outwardly-open groove;

a shrunk-fitted ring provided for said weapon barrel;

said gas rail and said shrunk-fitted ring conjointly defining a gas removal channel structure flow communicating said

gas receiving channel in said weapon housing and said gas removal location in said weapon barrel;

a gas throughflow element inserted into said gas removal channel structure;

said gas throughflow element being located in said gas removal channel structure in a transition region between said shrunk-fitted ring and said gas rail; and

a gas deflection insert postioned in said gas rail between said gas receiving channel and said gas rail.

4,798,125

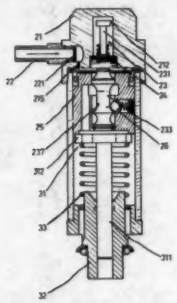
PNEUMATIC TYPE OF HYDRAULIC STRUCTURE

Fung M. Chang, No. 11, Lane 58, Tz Li Rd., Chung Ho; Chien C. Hsu, No. 18, Lane 89, Tung Hsin St. Nanking District, Taipei, and Wen C. Chen, No. 4, Alley 29, Lane 147, Chung Hsiao Rd., Lu Chou Village, all of Taiwan

Filed Nov. 3, 1987, Ser. No. 116,206

Int. Cl.[4] F15B *31/02*

U.S. Cl. 91—49 **1 Claim**



1. A pneumatically actuated hydraulic system comprising:

a hollow elongated body column member having threads formed on opposing ends thereof;

pneumatic means for actuating said hydraulic system, said pneumatic means including a lid body member having a first open end where said threads are engaged and a second closed end, said second closed end having a chamber formed therein, a position screw positionally located within an opening of said chamber, an inlet screw hole formed through a sidewall of said chamber having an air inlet passage hole positioned at a lower end of said air inlet screw hole;

a working lever member including a front end portion having a predetermined diameter and a rear end portion having an outer diameter greater than said front end portion diameter, said front end portion defining a convex edge located at one end of said front end portion and further including a front convex edge, a rear convex edge and a middle convex edge located respectively at a front, rear and central position near a rear section of said rear end portion, and including an air inlet engagement member located between said front convex edge and said middle convex edge of said rear edge, an air exhaust engagement member located between said middle convex edge and said rear convex edge, said position screw member positioned between said front convex edge of said front end portion of said working lever and said front convex edge of said rear end portion enabling said front end portion of said working lever to reciprocally move on said position screw, said position screw being secured onto said lid body member, a spring member is housed on a frontal end of said position screw of said front end portion;

a working body having a hollow chamber within which is located said working lever, said hollow chamber having an interior convex edge located at an extreme end of said hollow chamber to serve as a termination point for said working lever, an air exhaust ring groove located within said hollow chamber having a plurality of air exhaust holes fluidly connected with said ring groove, and placement holes formed within a lateral sidewall of said working body for placement of steel ball members;

an air inlet joint secured within said inlet screw hole serving as an inlet of air including a filtering net member mounted therein for filtering air;

hydraulic means for providing displacement of said hydraulic system, said hydraulic means including an hydraulic lever defining a lever composed of a lever portion and a pressing plate member located at a front end of said lever portion, passage holes located on said pressing plate member for exhausting air and contiguously interfacing with said working body of said pneumatic means;

a hollow housing body within which is contained said lever portion of said hydraulic lever, said hollow housing body having a convex edge located substantially near the central portion of said housing body, a spring location member secured at a frontal section of said convex edge and a joining thread located at an outer edge which may be threadedly secured with said threads of said main body member and further including a plurality of air release holes formed beneath said convex edge on said inverted groove of said location portion; and,

a working spring member located within said lever portion of said hydraulic lever having an upper section pressed against a lower portion of said pressing plate of said hydraulic lever and an opposing end located within said housing body.

4,798,126

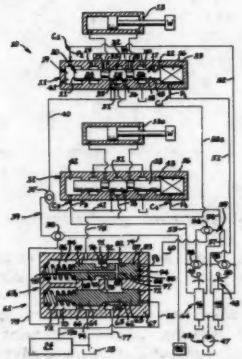
LOAD RESPONSIVE SYSTEM USING LOAD RESPONSIVE PUMP CONTROL OF A BYPASS TYPE

Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 23, 1987, Ser. No. 29,001

Int. Cl.[4] F15B *13/02*

U.S. Cl. 91—518 **18 Claims**



1. A fluid power load responsive system comprising an actuator, a system pump, reservoir means and at least one direction and flow control valve means, said direction and flow control valve means having a variable inflow metering orifice means operably connected to said actuator, spring biasing means operable to bias said inflow metering orifice means towards a closed position and first actuating means having first force generating means responsive to a control signal and operable to vary the flow area of said inflow metering orifice means above a certain first predetermined energy level of said control signal, bypass throttling means operable to maintain a relatively constant control pressure differential

between the discharge pressure of said system pump and pressure downstream of said inflow metering orifice means above said first predetermined energy level of said control signal, and deactivating means of said bypass throttling means having second force generating means responsive to said control signal and operable to deactivate said bypass throttling means below a certain second predetermined energy level of said control signal, said first predetermined energy level of said control signal being higher than said second predetermined energy level whereby discharge pressure of said system pump can be maintained below the level of said relatively constant pressure differential when said control signal drops below said second predetermined energy level.

4,798,127

TANDEM BRAKE PRESSURE CONTROL VALVE WITH PRESSURE-FAILURE-COMPENSATING PARALLEL PISTON

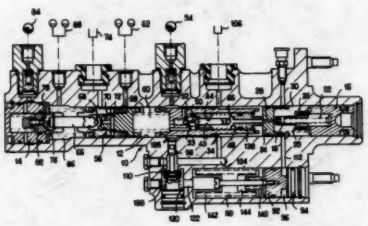
Roland Levral, Stains; Pascal Picot, Bonnevil sur Marne, and Christian Riquart, Paris, all of France, assignors to Bendix France, Drancy, France

Filed May 26, 1987, Ser. No. 54,453

Claims priority, application France, May 28, 1986, 86 07619

Int. Cl.[4] B60T *13/14, 15/02*; F15B *17/02*

U.S. Cl. 91—530 **7 Claims**



1. A hydraulic assistance device, comprising a body having a first bore in which first and second piston means are mounted slidably, the first piston means displaceable under the effect of the actuation of a third piston mounted slidably in the bore, the second piston means displaceable by means of a hydrostatic connection formed in a working chamber defined between the first and second piston means, there being associated with the first and second piston means respective piston valve means in respective hydraulic circuits between a fluid source under pressure and a respective brake circuit, a first chamber defined in the bore between the first piston means and third piston and connected to a tank of fluid under low pressure through valve means which closes after a predetermined displacement of said third piston, a second bore in which a fourth piston is mounted slidably in order to define together with a closed first end of said second bore a second chamber in hydraulic communication with said first chamber, a second end of said second bore being in hydraulic communication with the low pressure tank through second valve means controlled by fluid pressure of the fluid source under pressure, said fourth piston being displaceable by the fluid pressure in the first chamber, and the fourth piston biased by first spring means.

4,798,128

DOUBLE ACTING CYLINDER UNIT

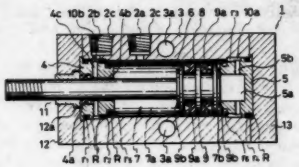
Tatsumi Mita, Higashiyamato, Japan, assignor to Koganei Ltd., Japan

Filed Jul. 14, 1987, Ser. No. 72,860

Claims priority, application Japan, Jul. 16, 1986, 61-108904[U]

Int. Cl.[4] F01B *29/04*

U.S. Cl. 92—59 **4 Claims**



1. A double acting cylinder unit having a front end and a rear end, comprising:

concentric inner and outer cylinder tubes forming there between a fluid path;

a piston positioned in the bore of said inner cylinder tube partitioning said inner cylinder tube into first and second spaces;

a pair of feed-exhaust ports located near one end of said outer cylinder tube;

a first pair of communication passages for communicating one of said feed-exhaust ports with said first space and the other of said ports with said second space when said outer cylinder tube is oriented with said feed-exhaust ports proximal the front end of said unit; and

a second pair of communication passages for communicating the other of said feed-exhaust ports with said first space and said one port with said second space when said outer cylinder tube is oriented with said feed-exhaust ports proximal the rear end of said unit.

4,798,129

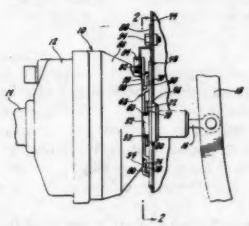
CAM AND LOCK VACUUM BOOSTER MOUNT WITH INVERSE ARC SECURING TAB ARM

Vincent M. Staub, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 9, 1987, Ser. No. 1,697

Int. Cl.[4] F01B *11/02, 29/00*; B25G *3/16*

U.S. Cl. 92—128 **2 Claims**



1. In an arrangement for rotatably mounting and dismounting a brake booster about the brake booster axis to and from a fixed panel, mechanism selectively securing the brake booster in its mounted position against rotation about its axis relative to the fixed panel, said mechanism comprising:

a bracket secured to the brake booster and providing a part of the brake booster mounting and dismounting arrangement, said bracket having an annular main body provided

with rotatable camming means thereon which are adapted to cooperate with mating camming means on the fixed panel to mount the brake booster, said bracket further having an arm extending therefrom so as to have its outer end positioned radially outward of said bracket annular main body but terminating short of the maximum radius of the brake booster so as to be at least partially protected thereby during handling;

said bracket arm outer end being formed with a reverse arc flange bent from said arm so as to extend toward the brake booster, the center of the arc radius of said flange being positioned outwardly of said arm to provide the reverse arc;

and a plate-like tab having an arcuate slot formed in one end complementary with said reverse arc flange and receiving said flange therethrough, said tab slot having the center of its arc radius located at an intermediate part of said plate-like tab and, when said flange is extending therethrough, being coincident with the center of the arc radius of said flange, said plate-like tab further having an opening formed in its other end;

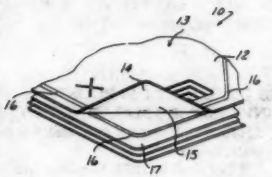
and means extending through said tab other end opening, said means securing said tab to the fixed panel against movements relative thereto, the reverse arcs of said tab slot and said bracket arm flange preventing rotational movement of said bracket and the brake booster in either arcuate direction relative to the fixed panel about the rotational mounting and dismounting axis of the brake booster.

4,798,130

DOOR WATER DEFLECTOR AND VENT

Alfred R. Dixon, 4023 Far Hill, Bloomfield Hills, Mich. 48013

Filed Dec. 3, 1987, Ser. No. 128,062
Int. Cl.[4] B60H 1/26
U.S. Cl. 98—2.18 **15 Claims**



1. An automobile body panel liner useful for maintaining a water and air barrier between the interior and exterior of said automobile body panel in an automobile body, said liner comprising:

(a) a waterproof liner sheet formed to the dimensions of a particular automobile body panel and having first and second faces, said first face of said liner being for engagement with said automobile body panel and having a surface characteristic which ensures adhesion of an adhesive, and said second face being for facing the interior of said automobile body and having a surface characteristic which ensures release of any adhesive contacting said surface; and

(b) an adhesive bead applied to said first face for mounting said liner sheet to said automobile body panel,

wherein a plurality of such liners may be pre-glued and stacked, one upon another, said adhesive adhering to said first face and said second face serving as a release surface to facilitate simple pick-up and press-in-place installation of the liner onto said body panel.

8. The apparatus of claim 1 further comprising:

(a) means forming at least one aperture disposed on the liner sheet for allowing the passage of air therethrough, and positioned on said sheet so as to coincide with similar, but slightly larger, body apertures formed in said automobile body panel;

(b) a Mylar sheet flap for covering each of said apertures and configured to be slightly larger than each of said apertures, said Mylar sheet having memory characteristics which cause it to return to its original position following non-deformable bending; and

(c) attaching means at the top edge of each Mylar flap for fixedly attaching said flap to said first face of said sheet so as to cover each air passage aperture,

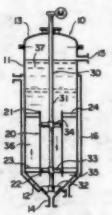
wherein said Mylar flap is operable in a hinge-like manner to move from a first closed position where said Mylar flap is closed over said air passage aperture to a second open position where said flap allows air passage through said air passage aperture, in only one direction, when air pressure is increased within said automobile body, and wherein said Mylar flap is returnable to its original flat position over said air passage apertures to prevent air passage in a second direction.

4,798,131

METHOD AND APPARATUS FOR TARTARS SEPARATION

Naotake Ohta, Takarzuka; Masahiro Yotsumoto, Ibaraki; Haruo Nishino, Takatsuki; Hiroshi Tanahashi, Osaka; Hajime Kato, Toyonaka; Toshiaki Tazawa, Ibaraki; Hideo Noda, and Yuzuru Wakabayashi, both of Amagasaki, all of Japan, assignors to Suntory Limited, Osaka and Kansai Chemical Engineering Co., Ltd., Amagasaki, both of, Japan

Filed Sep. 19, 1986, Ser. No. 909,329
Claims priority, application Japan, Sep. 24, 1985, 60-208914
Int. Cl.[4] C12F 1/00
U.S. Cl. 99—277.2 **12 Claims**



1. An apparatus for removing tartar from wine or grape juice, said apparatus comprising:

(a) a closed cylindrical crystallizing vessel,

(b) a draft tube open at its bottom and its top and positioned inside said cylindrical crystallizing vessel, said draft tube being centered in the bottom half of said cylindrical crystallizing vessel by supporting members mounted on said cylindrical crystallizing vessel, said draft tube and said cylindrical crystallizing vessel together defining an annular zone therebetween, said draft tube having a height of ⅓ to ⅔ the height of said cylindrical crystallizing vessel, the cross sectional area of said draft tube being smaller than the cross sectional area of the annular zone between said cylindrical crystallizing vessel and said draft tube;

(c) a stirrer disposed within said draft tube, said stirrer being sized, shaped, and positioned to make a downward flow inside said draft tube during use of said apparatus;

(d) a cooling jacket in thermal contact with the exterior of said cylindrical crystallizing vessel,

(e) the section of said cylindrical crystallizing vessel above said draft tube defining a calming section; and

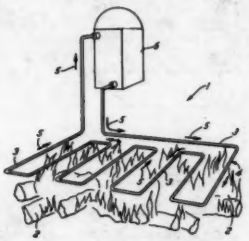
(f) said cylindrical crystallizing vessel having an inlet at the bottom thereof and an outlet at the top thereof so as to overflow liquid in said claming section as fresh liquid is introduced through said inlet.

4,798,132

CONTROLLABLE TEMPERATURE GRID ASSEMBLY FOR FOOD

Hing W. Chan, Tsuen Wan, Hong Kong, assignor to Hing Wah Houseware Manufactory Ltd., Hong Kong

Filed Sep. 17, 1986, Ser. No. 908,294
Claims priority, application United Kingdom, Sep. 19, 1985, 8523173
Int. Cl.[4] A47J 27/026, 37/06, 43/18
U.S. Cl. 99—331 8 Claims



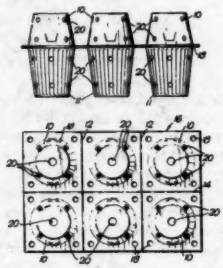
1. A controllable temperature grid assembly on which food can be cooked, including an array of spaced tubular members interconnected to form a generally planar grid on which food is placed for cooking by means of a high-temperature heat source below the grid, said tubular members comprising a single tube having a rectangular serpentine configuration and having hollow interiors interconnected to form a circulation flow path for a heat exchange medium, and heat exchange means in fluid flow communication with said hollow interiors for extracting heat from said medium, so that in operation when food is cooked on said grid, heat is extracted from the tubular members by said heat exchange medium flow, to cool said members and thereby reduce the tendency of food to stick to said members during cooking, the extracted heat being removed from the heat exchange medium during flow through the heat exchange means, and the cooled heat exchange medium recirculated through the hollow interiors of said tubular means.

4,798,133

PACKAGE AND CONTAINER FOR EGGS

William N. H. Johnson, 2, Mulberry Clove, Hampstead, London NW 3, United Kingdom

Continuation-in-part of Ser. No. 739,321, May 30, 1985, abandoned. This application Jun. 13, 1986, Ser. No. 874,126
Claims priority, application United Kingdom, Oct. 16, 1985, 8525498
Int. Cl.[4] B65D 85/32
U.S. Cl. 99—440 4 Claims



1. A package for eggs, comprising:

a plurality of containers detachably connected to one another, each of the plurality of containers being comprised of an upper portion and a lower portion,

wherein the upper portion and the lower portion each have:

(a) the form of a cup configured to define a chamber therein suitable for holding an egg when the upper portion and the lower portion are engaged with one another,

(b) a rim part comprised of a planar flange and means for retaining the planar flange of the upper portion engaged with the planar flange of the lower portion,

(c) at least one perforation defined therethrough to permit ingress and egress of water when the package is immersed in water to boil eggs contained therein, and

(d) a composition which is capable of withstanding the temperature of boiling water without losing structural integrity, which composition is comprised of a plastic material, and

wherein each lower portion has a side wall, which side wall has one of vertically extending flutes and vertically extending corrugations configured to grip an egg positioned therein and effective to provide thermal insulation between the egg and a person supporting the lower portion by hand from outside, and

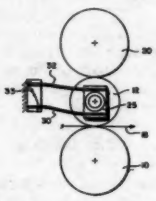
wherein the detachable connection of the plurality of containers is achieved by providing between adjacent containers one of lines of weakening and lines of perforations whereby each of the plurality of containers may be detached so that the lower portion thereof may function as an egg cup.

4,798,134

PRESSURE COMPENSATED SINGLE NIP THREE-ROLL PRESS

Jack Beery; Erik K. Nelson, both of Centerville, Ohio, and John J. Shelton, Tuttle, Okla., assignors to The Mead Corporation, Dayton, Ohio

Filed Sep. 11, 1987, Ser. No. 95,372
Int. Cl.[4] B30B 3/02
U.S. Cl. 100—171 8 Claims



1. In a three-roll press calender useful for the pressure fixing of toner images and the pressure development of microencapsulated latent images on web material in which one of a pair of parallel cylindrical pressing rolls, forming a pressing nip therebetween is loaded by a pressure roll by the application of a uniformly distributed force so as to urge said one pressing roll into engagement with the other said pressing roll along said nip under load and causing said pressing rolls to bend along common deflection curves and in which said pressing rolls are wider than said web material, wherein the improvement comprises:

means for matching the deflection curve of said one pressing roll to that of the other pressing roll at the edges of such web therebetween,

said means including means applying a constant biasing force to said one pressing roll urging the ends thereof toward said pressure roll by an amount proportional to the internal moment at locations corresponding to the edges of said web on said other pressing roll.

4,798,135

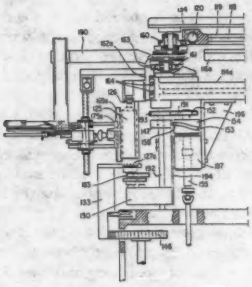
PROCESS AND A MACHINE FOR PRINTING ON ARTICLES BY SILK SCREENING

Steven A. Meredith, West Newbury, Mass., assignor to Imtran of Canada, Brampton, Canada

Division of Ser. No. 842,843, Mar. 19, 1986, Pat. No. 4,750,419. This application Apr. 20, 1988, Ser. No. 183,881

Int. Cl.[4] B41F *17/22*

U.S. Cl. 101—40 **18 Claims**



1. A machine for printing articles by silk screening at at least one print station, comprising:

a circular track;

means for moving articles to be printed and at least part of which are cylindrical continuously along said track about a track axis with the articles positioned with the surface to be printed perpendicular to the plane of movement along said track;

means for mounting a squeegee substantially linearly along the cylindrical part of the article parallel with the cylindrical axis of the article and for moving said squeegee about said track axis in the same direction as the article that is to be printed;

means for rotating the article around the cylindrical axis thereof;

means for mounting a silk screen stencil with the stencil between the squeegee and the article and in line contact with the cylindrical part of the article parallel to the cylindrical axis thereof for permitting the article and the squeegee to move along said stencil in the direction of the longitudinal dimension of the image pattern of the silk screen stencil for printing the image pattern on the cylindrical part of the article; and

means for moving said silk screen stencil for pivoting said silk screen stencil for maintaining the line of contact of the silk screen stencil with the article being printed upon on a radius of said circular track through the article being printed upon during movment of the article along said circular track during the printing process.

4,798,136

COLOR PRINTING METHOD AND ARRANGEMENT

Udo Tittgemeyer, and Thomas Litterst, both of Arnsberg, Fed. Rep. of Germany, assignors to Interprint Rotatinsdruk GmbH & Co. KG, Arnsberg, Fed. Rep. of Germany

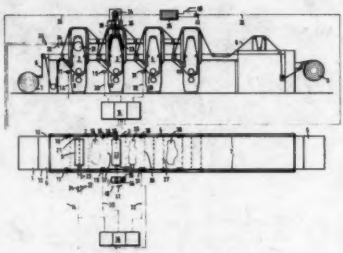
Continuation-in-part of Ser. No. 485,633, Apr. 18, 1983. This application Nov. 5, 1986, Ser. No. 927,885

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 3214001

Int. Cl.[4] B41F *5/06, 23/00, 13/02*

U.S. Cl. 101—181 **25 Claims**

1. A printing method, comprising the steps of conveying an image carrier along a predetermined path which extends through a first printing station, and a second printing station located downstream of said first station, said carrier having a pair of edges which are spaced transversely of said path; measuring the width of said carrier upstream of said first station by sensing both edges; imprinting a predetermined region of said carrier in said first station; remeasuring the width of said carrier between said first and second stations by sensing both edges; comparing the widths obtained during the measuring



and remeasuring steps; adjusting said carrier when the widths obtained from the measuring and remeasuring steps differ significantly from one another, comprising substantially equalizing the widths obtained during the measuring and remeasuring steps; and imprinting said region in said second station.

4,798,137

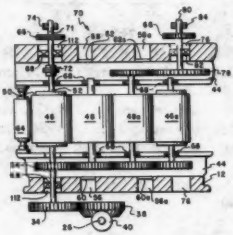
CONVERSION OF LETTERPRESS TO OFFSET PRINTING

Carl J. Hermach, Gulfport, Fla., and Duane H. Houy, Dallas, Tex., assignors to Publishers Equipment Corporation, Dallas, Tex.

Continuation of Ser. No. 685,226, Dec. 27, 1984, abandoned, which is a continuation of Ser. No. 32,240, Apr. 20, 1979, abandoned. This application Jun. 18, 1986, Ser. No. 876,293

Int. Cl.[4] B41F *5/06, 5/16, 5/22*

U.S. Cl. 101—211 **31 Claims**



1. A method for converting an existing web fed printing press unit operable only in a letterpress mode into a press unit operable in an offset mode, said press unit having a main frame comprising a pair of spaced apart parallel walls defining plural pairs of aligned bores, a pair of first cylinders comprising plate cylinders each rotatably supported in spaced apart relation upon bearings disposed in a pair of said aligned bores and a pair of second cylinders comprising impression cylinders each rotatably supported in spaced relation upon bearings disposed in a pair of said aligned bores, and each disposed for rolling contact with one of said plate cylinders, the steps comprising:

(a) removing from said press unit said pair of second cylinders which are impression cylinders, and substituting a pair of second cylinders which are blanket cylinders;

(b) adding to said press unit a cylinder receiving means for rotatably supporting at least one of said blanket cylinders, said means being positioned such that at least a portion

thereof is disposed externally of said bores in said main frame;

(c) supporting said cylinder receiving means upon said main frame;

(d) rotatably supporting said plate and blanket cylinders upon one of said main frame and cylinder receiving means with said blanket cylinders each disposed for rolling contact with the other and with one of said plate cylinders;

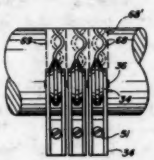
(e) including the step of eliminating the rotatable support of the bearings of at least one of said second cylinders from at least one pair of said aligned bores in said main frame and rotatably supporting the bearings of said at least one of said second cylinders on said cylinder receiving means upon such portion thereof as is external to said pairs of aligned bores in said main frame.

4,798,138

LIQUID DISTRIBUTION SYSTEM

George R. Brodie, 1015 N. Alexander St., Mt. Dora, Fla. 32757

Filed Jan. 12, 1988, Ser. No. 142,994
Int. Cl.[4] B41F *31/12*
U.S. Cl. 101—365 20 Claims



1. Liquid distributing apparatus, comprising:

a reservoir containing liquid to be distributed;

a first rotatable roll having an outer surface and a portion immersed in the liquid in said reservoir for picking up a film of the liquid onto said outer surface;

a second rotatable roll having an outer surface and being spaced laterally from and disposed parallel to said first roll;

a plurality of thin roller elements having radially-compressible resilient outer surfaces;

means mounting said roller elements in side-by-side relationship in contact with the outer surfaces of both of said first and second rolls; and

means for individually adjusting the position of each roller element relative to said first and second rolls to selectively set the contact pressure between the outer surface of each roller element and the outer surfaces of said rolls;

whereby ink brought up onto the first roll from said reservoir will be transferred to said second roll by said roller elements in the form of bands of ink, with the width of the bands of ink being determined by the settings of the contact pressures between the roller element outer surfaces and the roll outer surfaces.

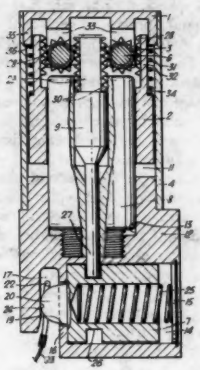
4,798,139

SOLENOID-OPERATED DEVICES

Dennis Griffin, Surrey, England, assignor to Frazer-Nash Limited, Kingston-upon-Thames, England

Filed Nov. 25, 1983, Ser. No. 559,039
Int. Cl.[4] F42C *15/24*
U.S. Cl. 102—216 25 Claims

1. A solenoid-operated device subject to inertial forces, comprising a solenoid having an armature mounted for rectilinear movement to and fro in the body of the device between operative and inoperative positions, a counterbalancing mass mounted for rectilinear movements to and fro along the same axis as the armature, and coupling connections between the armature and the counterbalancing mass such that when either



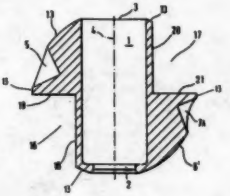
moves the other is driven to move in synchronism but in the opposite direction.

4,798,140

SAFETY FUSE FOR A SPINNING-TYPE PROJECTILE

Walter Winterhalter, Tennenbronn, and Andreas Haissig, Denkingen, both of Fed. Rep. of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Division of Ser. No. 775,400, Sep. 12, 1985, Pat. No. 4,691,635.
This application Aug. 31, 1987, Ser. No. 90,975
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1984, 3435402
Int. Cl.[4] F42C *15/26*
U.S. Cl. 102—251 6 Claims



1. In a safety mechanism for a fuse of a spinning-type projectile, said safety mechanism being of the type comprising a housing having a spherical cavity therein defined by a spherical surface, a spherical rotor rotatably disposed in said spherical cavity, said spherical rotor having a through-chamber therein carrying a detonator, said through-chamber defining a longitudinal axis and including first and second orifices at opposite longitudinal and second sides separated by a reference plane containing said longitudinal axis, said first and second orifices disposed on said spherical rotor periphery of said spherical rotor in substantially diametrically opposite relationship, said housing including a detonating passage leading to a detonable charge, said spherical rotor including a locking recess engaged by a releasable projection in said housing to lock said spherical rotor in a safety position wherein said first orifice is spaced from said detonating passage in the circumferential direction, said projection disposed diametrically opposite said detonating passage, a first empty cut-out formed in said spherical rotor periphery adjacent said first orifice to

reduce the mass of said spherical rotor, the improvement wherein a second empty cut-out is provided in said spherical rotor periphery adjacent said second orifice to further reduce the mass of said spherical rotor, said first and second cut-outs being arranged and configured such that no portion thereof overlies said detonating passage when said spherical rotor is in said safety position, said first and second cut-outs lying on said first and second sides, respectively, said locking recess disposed between said first cut-out and said second orifice on said first side of said spherical rotor, and a passage-covering portion of said spherical rotor periphery being disposed diametrically opposite said locking recess, said passage-covering portion being positioned between said second cut-out and said first orifice on said second side of said spherical rotor, said passage-covering portion arranged to overlie said detonating passage in said safety position of said rotor, said spherical periphery of said spherical rotor including a first surface area positioned between said passage-covering portion and said first orifice and a second surface area positioned between said passage-covering portion and said second cut-out, said first and second surface areas making surface area contact with said spherical surface of said spherical cavity to block communication between said detonating passage and said first and second orifices when said spherical rotor is in said safety position, said first and second cut-outs being separated from said through-chamber by walls defined by portions of said rotor, each of said first and second cut-outs being formed by a pair of walls extending parallel to said reference plane and the other of said walls extending perpendicular to said reference plane, said other walls lying in a common plane containing a center of said spherical rotor.

4,798,141

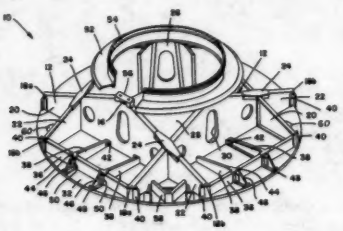
MISSILE EQUIPMENT SECTION STRUCTURE

Daniel Cunha, Felton; Wayne M. Brown, San Jose; James E. Pool, Saratoga, and Thomas M. Sheperd, Cupertino, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 31, 1987, Ser. No. 82,777

Int. Cl.[4] F42B *15/00*

U.S. Cl. 102—293 **9 Claims**



1. A missile structure for providing structural support for equipments mounted on an upper stage of a multistage missile, said structure being mounted within the circular outer shell of said missile, which comprises:

(a) a circular aft panel, said aft panel having a circumference adapted to abut the circular shell of said missile;

(b) four main stiffening beams, said four main stiffening beams being fixed to the forward side of said aft panel, said four main stiffening beams being disposed to intersect at right angles to form a central square structure with intersecting walls, said intersecting walls extending outward from the central square structure to the missile shell; and

(c) four diagonal stiffening beams, said diagonal beams being fixed to forward side of said aft panel and to said main stiffening beams, said diagonal beams disposed within the central square structure across the corners of said central square structure, said four diagonal beams and said four main beams forming a central octagonal structure.

4,798,142

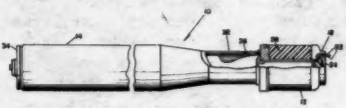
RAPID BURING PROPELLANT CHARGE FOR AUTOMOBILE AIR BAG INFLATORS, ROCKET MOTORS, AND IGNITERS THEREFOR

J. B. Canterberry, Taft, Tenn., and David A. Flanigan, Ogden, Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Aug. 18, 1986, Ser. No. 908,763

Int. Cl.[4] C06D *5/06*

U.S. Cl. 102—290 **7 Claims**



1. A propellant charge comprises a reticulated substrate having a quantity of interconnected ligaments and a coating of solid propellant material on said ligaments, said coating has a thickness such that interstices are between coated ligaments which interstices define propellant surface area for combustion.

4,798,143

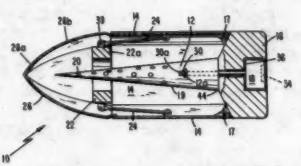
GAS DISPENSING PROJECTILE

Douglas Graham, Box 478, Riyadh, Saudi Arabia

Filed May 6, 1987, Ser. No. 46,921

Int. Cl.[4] F42B *13/32, 13/46*

U.S. Cl. 102—370 **28 Claims**



28. A projectile, comprising an elongate piercing member and stop means connected to the piercing member for deployment, in response to movement of the piercing member through a material being pierced, from a retracted position wherein the stop means extends generally along a longitudinal axis of the piercing member to an extended position wherein the stop means moves outwardly from the longitudinal axis into a maximum diameter position to arrest and cause abrupt lodgement of the projectile in said material, said stop means being a plurality of panels defining an outer casing establishing the projectile body.

4,798,144

HOLLOW CHARGE SHELL CONSTRUCTED AS DRILL AMMUNITION

Horst Apholt, Hagen, Fed. Rep. of Germany, assignor to Hoesch Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 904,031

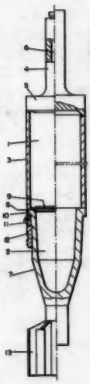
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 353224112

Int. Cl.[4] F42B *13/20, 13/22*

U.S. Cl. 102—445 **16 Claims**

1. A wing-stabilized hollow charge shell which is constructed as drill ammunition and has a tail unit of the same

caliber comprising a shell case having a front and a rear explosive chamber, and an end face adjacent the front explosive chamber and being provided at the end face of the shell case with a detonator rod, characterized in that the entire shell case,



including the detonator rod (4), is formed by parts which consist of the same metallic material and which are undetachable and fixedly connected together by friction welding and at least one of said front explosive chamber, rear explosive chamber and said detonator rod is produced by forging.

4,798,145

HOLLOW CHARGE AND LINER ASSEMBLAGE

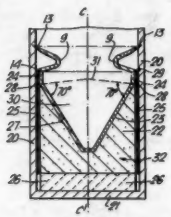
John S. McVeagh, Seaview, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom, London, England

Filed Dec. 3, 1982, Ser. No. 450,439

Claims priority, application United Kingdom, Dec. 8, 1981, 8136923

Int. Cl.[4] F42B *11/22*

U.S. Cl. 102—476 **10 Claims**



1. A hollow charge and liner assemblage including:

a tubular casing having a closed rear end and an open front end;

a hollow charge container slideable within the casing comprising a hollow charge liner peripherally attached to a rearwardly extended tubular sleeve;

a charge assemblage contained within the container including an explosive charge having a hollow forward face in contact with the liner, and a rearwardly extended portion protrusive beyond the sleeve; and

a compression means located within the casing forward of the container and operative between the casing and the container so as to urge the container rearwardly relative to the casing thereby axially compressing the charge assemblage between the liner and the rear end of the casing.

4,798,146

SUSPENSION MEANS FOR A RUNNING RAIL OF A SUSPENSION RAILWAY

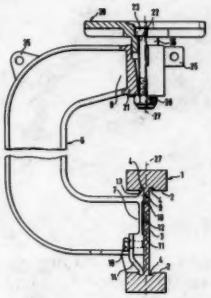
Hartmut Roetzel, Rameldange, Luxembourg, assignor to Cleveland Tramrail International S.A., Clervaux, Luxembourg

Filed May 30, 1986, Ser. No. 868,730

Claims priority, application Luxembourg, May 31, 1985, 85923

Int. Cl.[4] E01B *25/24*

U.S. Cl. 104—111 **19 Claims**



1. Suspension means for a running rail of a suspension railway comprising a running rail which is formed as double T profile with horizontal chords and a vertical web connecting the chords, grooves extending parallel to the web in the facing inner sides of the chords and a suspension arm having at the lower free end a suspension plate, and means for pressing the suspension plate onto the running rail, characterized in that the suspension plate engages with its upper edge into the groove of the upper chord and that at least one securing claw is provided which is offset with respect to the vertical axis of the suspension plate and which engages with its lower edge into the groove of the lower chord and which by at least one securing means is firmly pressed together with the side of the suspension plate remote from the web.

4,798,147

DRIVE WHEEL ADJUSTER FOR DRIVERLESS VEHICLE

Roger A. Pyle, Wind Gap, and Per E. Lindqvist, Easton, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Apr. 22, 1987, Ser. No. 41,176

Int. Cl.[4] B61B *13/12*

U.S. Cl. 104—166 **7 Claims**

7. A driverless vehicle which is propelled by a drive tube and having support wheels for guiding the vehicle over a track which includes a drive tube following a curve, comprising:

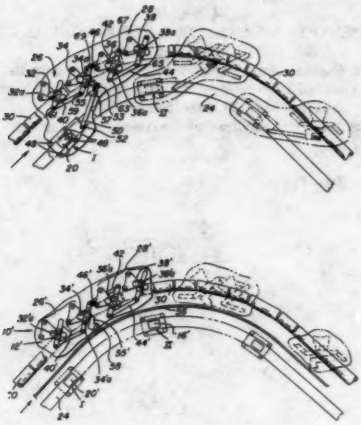
a platform,

said support wheels being mounted so as to swivel relative to said platform,

at least two drive wheels yieldingly biased to a predetermined angular orientation relative to the platform and adapted for frictional contact with said drive tube such that the angular orientation of each drive wheel with respect to the drive tube varies as the vehicle negotiates the track curve, and

means for controllably pivoting at least one, but less than all of said drive wheels so as to vary the angular orientation thereof with respect to the platform as the vehicle negotiates the track curve such that the angular orientation of

the drive wheel with respect to the drive tube substantially matches the angular orientation of the other of the



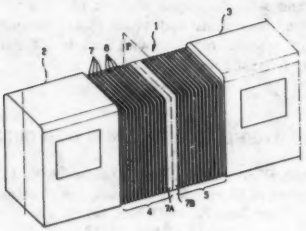
two drive wheels with respect to the drive tube as the vehicle negotiates the track curve.

4,798,148

DEVICE FOR INTERCOMMUNICATION BETWEEN COUPLED VEHICLES IN WHICH PASSENGERS CAN WALK FREELY, ESPECIALLY RAILWAY CARS OR ROAD VEHICLES

Jean-Michel Girard, Paris Défense, France, assignor to A.N.F. Industrie, Crespin-Blanc-Misseron (Nord), France

Filed Dec. 1, 1987, Ser. No. 127,087
Int. Cl.[4] B61D *17/22*; B60D *5/00*
U.S. Cl. 105—17 **12 Claims**



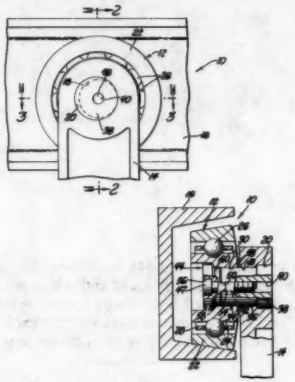
1. A device for intercommunication between two oppositely-facing open ends of two coupled vehicles in which passengers can walk freely, in particular railway cars, road vehicles such as articulated buses or trolley buses or else specialized vehicles such as passenger bridges of the type used in large airports, said device comprising a series of rings of generally rectangular shape which consist alternately of rigid rings and flexible rings suitably attached to each other so as to form a flexible intercommunication tunnel having a longitudinal axis, ends of the tunnel being adapted to be attached respectively to the aforementioned open ends of said vehicles and wherein each rigid ring is constituted by two rigid-ring segments assembled together, said rigid ring segments defining a pair of annular channels formed in an abutting surface thereof, wherein the flexible rings are of elastomer and each has a flexible intermediate portion provided along the longitudinal axis of the tunnel with each end thereof comprising a membrane terminating in a bulge in the form of a substantially cylindrical-strip member, said members being imprisoned in said annular channels.

4,798,149

WHEEL LOCK ASSEMBLY

Frank F. Hoffmann, St. Clair, Mich., assignor to Florkey's Conveyor Service, Inc., Warren, Mich.

Filed Dec. 2, 1982, Ser. No. 446,195
Int. Cl.[4] F16C *33/60*
U.S. Cl. 105—155 **9 Claims**



6. A wheel lock assembly for reversibly rotatably mounting a wheel assembly comprising an inner race and an outer race and bearings disposed therebetween on a trolley arm including a central bore having a central axis and having a substantially annular recess eccentric relative to the central bore, said assembly comprising:

an axle member including a cylindrical body portion having a longitudinal axis and an enlarged substantially annular head portion eccentric relative to said longitudinal axis;

a cap member; and

fastening means for fastening said cap member to an end of said body portion to draw said cap member into frictional engagement with the inner race and to draw said head portion into mating engagement with the recess of the trolley arm.

4,798,150

APPARATUS FOR HANDLING ASH

Dale W. Pressnall; Michael R. Keller, and Robert E. Schwartz, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Nov. 25, 1987, Ser. No. 125,249
Int. Cl.[4] F23J *1/02*
U.S. Cl. 110—171 **22 Claims**

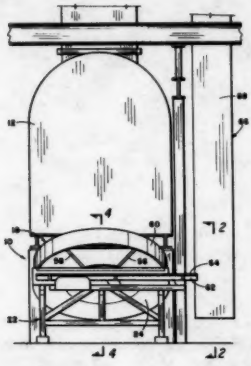
1. Ash handling apparatus comprising:

a container having a substantially planar surface formed therein, said container being filled with liquid for receiving ash when said apparatus is in operative condition;

an elongate paddle element for sweeping across said planar surface thereby collecting such ash along the front thereof, said paddle element being pivotally mounted on said planar surface;

means for rotating said paddle element;

means for reversing the direction of rotation of said paddle element; and



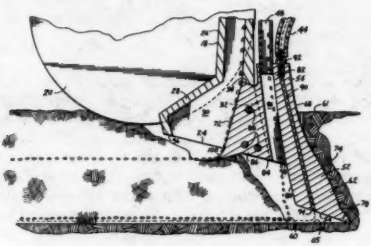
means adjacent said container for receiving ash collected along the front of said paddle element.

4,798,151

FURROW OPENING POINT

John G. Rodrigues, Jr., and Gale Rettkowski, both of Wilbur, Wash., assignors to R & R Innovations, Inc., Wilbur, Wash.

Filed Sep. 1, 1987, Ser. No. 92,180
Int. Cl.[4] A01C *5/08, 23/02*
U.S. Cl. 111—73 6 Claims



1. A fertilizer furrow opening device for attachment to a seed boot of a seed drill in which the seed boot has a seed passageway extending downward therethrough terminating in a seed drop opening along a lower profile, said opening device comprising:

an elongated body including a soil engaging portion, for extending from below a soil level when the seed drill is in a soil working position to form a deep, narrow two-tier furrow in front of the seed boot, said elongated body also extending upward to a fertilizer receiving portion, above the soil level to receive both a liquid fertilizer conduit and a dry granular fertilizer conduit;

wherein the soil engaging portion has an upper soil engaging section that extends downward from the fertilizer receiving portion for forming an upper segment of the two-tier furrow to receive seed from the seed drop opening along a seed line formed at a base of the upper segment of the two-tier furrow;

wherein the soil engaging portion has a lower knife section that extends downward and forward from the upper soil engaging section terminating in a bottom edge having a leading tip for forming a narrow lower segment of the two-tier furrow to receive both liquid and dry granular fertilizers therein substantially below the seed line at a base of the lower segment of the two-tier furrow;

wherein the upper soil engaging section and the lower knife section of the furrow opening device have leading faces for initially opening the soil, in which the leading face of the lower knife section has a substantially thinner horizontal front profile than the leading face of the upper soil engaging section so that the lower segment of the two-tier furrow is substantially narrower than the upper segment of the two-tier furrow; and

wherein the upper soil engaging section includes a rear face and the lower knife section includes a trailing face opposite to the leading faces;

said elongated body having a mounting bracket portion extending rearward of the soil engaging portion for mounting the furrow opening device to the seed boot with the lower knife section extending substantially forward and below the seed drop opening;

said elongated body having a fluid passageway formed therein extending from the fertilizer receiving portion through the soil engaging portion to the bottom edge of the lower knife section for communicating with the fluid fertilizer conduit and directing the fluid fertilizer down through the elongated body including the lower knife section and exiting from an opening in the bottom edge of the lower knife section to deposit the fluid fertilizer into the lower segment of the two-tier furrow forward of the seed drop opening and below the seed line; and

said elongated body having a dry granular fertilizer passageway formed therein extending from the fertilizer receiving portion through a dry granular fertilizer subsection of the device and terminating in a dry granular fertilizer opening adjacent the trailing face of the lower knife section to direct dry granular fertilizer from the dry granular fertilizer conduit through the elongated body to the dry granular fertilizer opening and into the lower segment of the two-tier furrow along the trailing face of the lower knife section.

4,798,152

DYNAMIC TEST SYSTEM FOR SEWING THREADS

Frank H. Simons, and Benjamin A. Ferguson, both of Charlotte, N.C., assignors to Celanese Fibers, Inc., New York, N.Y.

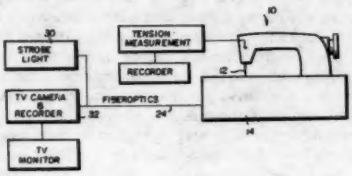
Filed Jul. 27, 1987, Ser. No. 78,423
Int. Cl.[4] D05B *81/00, 79/00*
U.S. Cl. 112—262.1 15 Claims

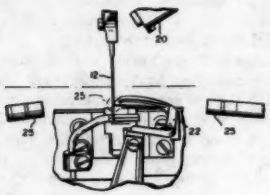
11. A method for viewing the region of stitch formation within the bed of a sewing machine, comprising the steps of:

disposing a first fiberoptic bundle within the bed of the sewing machine with one end thereof disposed opposite said stitch formation region;

transmitting light from a strobe light along said first fiberop-

tic bundle and through said one end thereof to periodically illuminate said stitch formation region; and





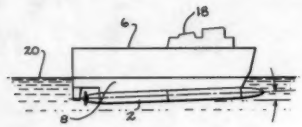
providing visual images of the stitch formation region from information transmitted from said region along said first fiberoptic bundle.

4,798,153

STABILIZED HULL SWATH VEHICLE

Terrence W. Schmidt, Santa Clara, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Aug. 23, 1984, Ser. No. 643,428
Int. Cl.[4] B63B *1/12*
U.S. Cl. 114—61 **2 Claims**



1. A hull stabilized, low water plane area, twin hull vessel having a design waterline, said vessel comprising: a plurality of substantially tubular shaped lower hulls for providing buoyancy support for said vessel, an upper hull, a plurality of struts, each strut connecting a lower hull to said upper hull, said struts mounting the said lower hull at an acute angle to said design waterline wherein the vertex of said acute angle is forward of said vessel.

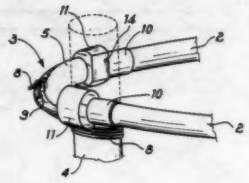
4,798,154

COUPLING ELEMENT OF THE BOOM TO THE MAST OF A SMALL SAILING CRAFT

Enzo Scaglia, 20, Via Monterosa, Milan, Italy

Filed Nov. 19, 1986, Ser. No. 932,723
Claims priority, application Italy, Nov. 22, 1985, 23945/85[U]
Int. Cl.[4] B63B *15/00*
U.S. Cl. 114—98 **14 Claims**

1. Apparatus for connecting the boom to the mast in a sailing craft which comprises a coupling member secured to the boom and having a seating section for receiving a portion of the mast; at least one predominantly cylindrical support for the mast, the cylindrical support being rotatably attached to the coupling member adjacent the seating section and having a substantially



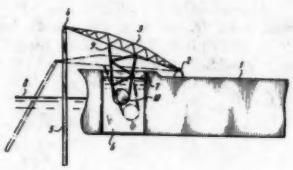
flat surface constantly in contact with the mast whatever the coupling position of the mast and the boom.

4,798,155

MOORING DEVICE

Leendert Poldervaart, La Turbie, France, assignor to Single Buoy Moorings, Inc., Marly, Switzerland

Filed May 3, 1984, Ser. No. 606,515
Claims priority, application Netherlands, May 3, 1983, 8301558
Int. Cl.[4] B63B *21/50*
U.S. Cl. 114—230 **14 Claims**



1. In a mooring device comprising a tanker floating on the surface of a body of water and having an arm pivotably connected to the vessel at one point on the arm, a tension-resistant connecting member connected to said arm at a second point spaced from said one point and extending toward the bottom of the body of water and connected to a bottom anchor, and a body having positive buoyancy in water and whose buoyancy exerts an upward force to maintain said connecting member under tension; the improvement in which the ship has a hull that has interior side walls that laterally surround a protected space that contains a liquid in which said body is at least partially submerged and has positive buoyancy, said body having large clearance with respect to said side walls, said protected space extending above and below the surface of said body of water.

4,798,156

ARRANGEMENT FOR DEPLOYMENT OF SEISMIC CABLES

Jan-Age Langeland, Garnes; Einar Gjestrum, Boverbu, and Rolf Bjerkoy, Melsomvik, all of Norway, assignors to Geco A.S., Sandvika, Norway

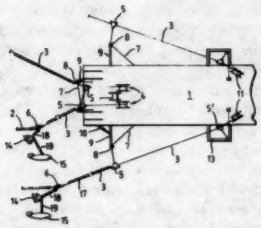
Filed Jul. 9, 1987, Ser. No. 71,353
Claims priority, application Norway, Jul. 17, 1986, 862885
Int. Cl.[4] B63B *21/56*
U.S. Cl. 114—242 **10 Claims**

1. An arrangement for deployment and towing of a plurality of seismic streamers behind a vessel in parallel at mutually spaced distances comprising for each seismic streamer:

a winch barrel rotatably mounted on the vessel;

an inner cable member connected to the seismic streamer and wound on said winch barrel for towing the seismic streamer at variable distances from the vessel;

a derrick means mounted on the vessel;
a guide pulley line extending from the vessel over said derrick means;
a guide pulley means suspended on said guide pulley line, said inner cable member running through said guide pulley means;



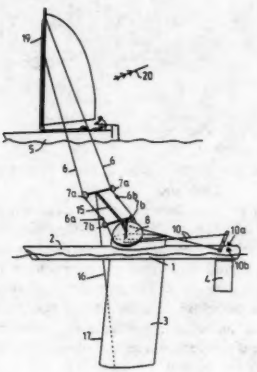
means for adjusting the disposition of said guide pulley means relative to the vessel for adjusting the position of said guide pulley means and said inner cable member relative to the vessel and said derrick means; and
paravane control means attached to said inner cable member for controlling the lateral disposition of the seismic streamer and said inner cable member when the seismic streamer is deployed for use.

4,798,157

DROGUE ASSOCIATED WITH A GUIDANCE SYSTEM

Jean Duret, 27 rue de la Double Haie, 60300 Senlis, France

Filed Jan. 30, 1987, Ser. No. 945,059
Claims priority, application France, Apr. 2, 1985, 8504965
Int. Cl.[4] B63B *1/24*
U.S. Cl. 114—253 **7 Claims**



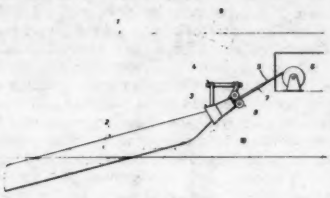
1. A guidance system comprising:
a craft,
a drogue towed by said craft,
a rope connected to said drogue and said craft for towing said drogue,
said drogue including a float, a centerboard, and steering means including a wheel connected to said rope, an axis of said wheel coinciding with a yaw axis of said float and said drogue having static stability about its center of gravity; and
lateral stability about a roll axis of said float being provided by means of an arm which is free to rotate about said axis of said wheel and an end of said arm being connected to said centerboard by a length of cord.

4,798,158

SEISMIC FLOAT RECOVERY SYSTEM

Carl G. Langner, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 810,621, Dec. 19, 1985, abandoned.
This application Jun. 30, 1987, Ser. No. 68,813
Int. Cl.[4] B63B *21/16*
U.S. Cl. 114—253 **3 Claims**



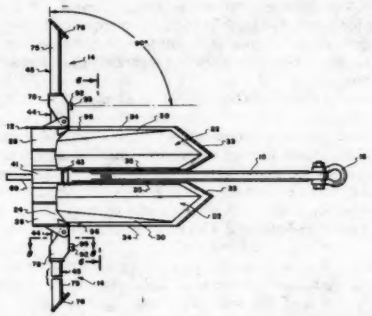
1. A method for retrieving a seismic float from waves alongside a tow vessel to onboard the tow vessel, comprising:
providing a docking means rigidly affixed to the tow vessel, the docking means being a cone and a connection means passing from the tow vessel through the cone;
storing the cone in an upward position on the tow vessel, then rotating the cone around an axis not perpendicular to the axis of the cone to a downward position to receive the seismic float, and connecting the front end of the seismic float to the connection means;
rotating the around an axis not perpendicular to the axis of the cone to an intermediate position to elevate the front end of the seismic float beside the tow vessel for eventual retrieval; and
thereby allowing the rear end of the seismic float to submerse beneath the water, and damping up and down movement of the seismic float with wave action.

4,798,159

ANCHOR WITH FOLDING SELF-DEPLOYING STABILIZERS

Robert J. Taylor, and Daniel G. True, both of Camarillo, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 25, 1988, Ser. No. 147,967
Int. Cl.[4] B63B *21/26*
U.S. Cl. 114—295 **18 Claims**



1. In a mooring anchor having a shank assembly and a pivot-

able fluke assembly for general use in a variety of seafloor materials, the improvement being self-deploying roll stabilizes comprising:

a. a pair of stabilizer assemblies each consisting of a fixed component and a movable component; said stabilizer assemblies being affixed to opposite sides of the pivotable fluke assembly, respectively;

b. said fixed components being mounted on respective opposite sides of the fluke assembly, approximately along the pivot axis of said fluke assembly;

c. each of said movable components being elongated and being connected at one end thereof by hinge means adjacent to an outer end of a respective said fixed component; said movable components capable of being fooled in a forward direction for stowage along the general direction of the anchor shank longitudinal axis and for being opened to extend outwardly in a direction along the fluke pivot axis to a fully operable anchor roll stabilizing position;

d. plow means mounted at outer ends of said movable components; each said plow means comprising a force reaction surface means positioned at an acute angle to the anchor shank longitudinal axis when said elongated movable component is in the stowed position for reacting against various materials which the anchor moves through in a marine environment; said plow means being operable to cause said movable components to swing about said hinge means and deploy said movable components to the fully operable roll stabilizing position.

4,798,160

SHIFT-LEVER POSITION INDICATING DEVICE FOR AUTOMATIC POWER TRANSMISSION

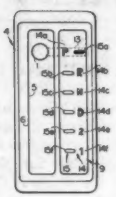
Haruo Mochida, Kanagawa, and Yasushi Asano, Toyohashi, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Continuation of Ser. No. 290,737, Aug. 6, 1981, abandoned. This application Dec. 30, 1983, Ser. No. 567,131

Claims priority, application Japan, Aug. 26, 1980, 55-121034

Int. Cl.[4] G09F *9/00*

U.S. Cl. 116—28.1 **8 Claims**



1. A shift-lever position indicating device for indicating selected positions of a shift lever of an automatic power transmission system wherein said shift lever is pivotally movable to a plurality of positions including a parking-gear position, comprising

a casing structure formed with an elongated slot for permitting the shift lever to move therethrough, the casing structure having an illuminating chamber defined therein,

a light source located within said illuminating chamber and operative to emit light in the illuminating chamber,

said casing structure including an indicator plate carrying thereon a mark indicative of said parking-gear position of said shift lever and a series of marks respectively indicative of the remaining positions of the shift lever,

said indicator plate having a light pervious portion located in conjunction with the mark indicative of the parking-gear position of the shift lever and light pervious portions located respectively in conjunction with the marks indicative of said remaining positions of the shift lever,

the light pervious portions located in conjunction with the marks indicative of said remaining positions of the shift lever being arranged in a predetermined relationship in said indicator plate and the light pervious portion located in conjunction with the mark indicative of the parking-gear position of the shift lever being located unconformably to said relationship with respect to the remaining light pervious portions such that said remaining portions are disposed in a line and said and said light pervious portion located in conjunction with the mark indicative of the parking-gear position of the shift lever is offset from said line, and

a pointer element secured to said shift lever and movable in said illuminating chamber, the pointer element having a first light pervious portion movable between said light source and said light pervious portion located in conjunction with the mark indicative of the parking-gear position of the shift lever and a second light pervious portion movable between said light source and said remaining light pervious portions, the first and second light pervious portions differing in color from each other.

4,798,161

DISPLAY DEVICE, IN PARTICULAR FOR AN AUTOMATIC GEAR BOX

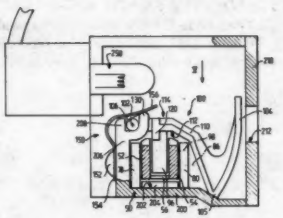
André Lazareff, Clichy, France, assignor to Jaeger, France

Filed May 10, 1988, Ser. No. 192,226

Claims priority, application France, May 13, 1987, 87 06736

Int. Cl.[4] B60K *20/00*

U.S. Cl. 116—28.1 **11 Claims**



1. A display device comprising:

a control member;

a carriage displaced along a predetermined path by the control member; and

a plurality of flaps distributed at a constant pitch along the path of the carriage, with each flap being equipped with a cam suitable for engaging the carriage in order to displace the associated flap from a rest position to an operated position, said cams being positioned in predetermined different positions relative to the corresponding flaps in order to define a predetermined relationship between carriage displacement and the successive instants at which the flaps are moved.

4,798,162

EASTER EGG DECORATING DEVICE

Robert T. Nelson, 321 Bay Ave., Huntington, N.Y. 11743

Filed Jul. 20, 1987, Ser. No. 75,105

Int. Cl.[4] B05C *3/02*

U.S. Cl. 118—26 **2 Claims**

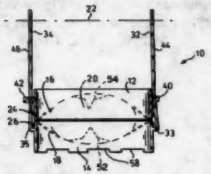
1. An Easter egg decorating device which securely holds an egg so that the entire surface thereof may be colored in a coloring bath and which is used in conjunction with a pattern which leaves an area of the egg defined by the pattern uncolored, said device comprising:

(a) a substantially oval shaped first cylindrical segment hav-

ing a cheesecloth diaphragm covering one open mouth thereof;

(b) a substantially oval shaped second cylindrical segment having a cheesecloth diaphragm covering one open mouth thereof; said cheesecloth diaphragms being permeable to the coloring fluid in the coloring bath, and each having a skirt portion overhanging the respective cylindrical segment releasably secured to the segment by a rubberband which engages the skirt portion of the diaphragm and clamps it to the segment;

(c) means interconnecting said first and second cylindrical segments so that they are substantially axially aligned with the diaphragm covered mouths thereof facing each other,



said means comprising first and second straps hingedly connected to the outer surface of said first cylindrical segment and oppositely disposed from one another, ears axially aligned with said straps extending from the outer surface of said second cylindrical segment and having openings therein for receiving said respective straps, and ratchet-like serrations extending along each strap and an engagement cam associated with each ear which engages said serrations for releasable and adjustable engagement of said straps with said ears, so that the egg may be held between the diaphragms with sufficient force that the pattern is pressed against the egg so as to exclude the coloring bath therefrom.

4,798,163

SLIT NOZZLE

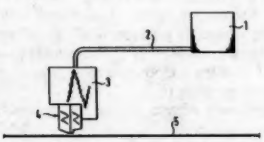
Henning J. Claassen, Lüneburg, Fed. Rep. of Germany, assignor to Meltex Verbindungs-Technik GmbH, Lüneburg, Fed. Rep. of Germany

Continuation of Ser. No. 934,963, Nov. 25, 1986, abandoned. This application May 5, 1988, Ser. No. 190,725

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541784

Int. Cl.[4] B05C *5/02*

U.S. Cl. 118—410 **4 Claims**



1. A nozzle for a liquid adhesive applicator comprising:

first and second members having interfacing surfaces defining an adhesive exit slit therebetween,

a spreading chamber in one of said interfacing surfaces of one of said members, and

a supply passage opening through the interfacing surface of the other said member into said spreading chamber at an angle relative to said exit slit, said supply passage comprising the only opening through said interfacing surface of said other member and having a relatively narrow cross-section compared to the cross-sectoin of said spreading chamber, said exit slit emanating from said spreading chamber with said supply passage on one side of said exit slit and said spreading chamber entirely on the other side of said exit slit.

4,798,164

APPARATUS FOR APPLYING GLAZE AS GRANULES TO TILES MAINTAINED AT A HIGH TEMPERATURE

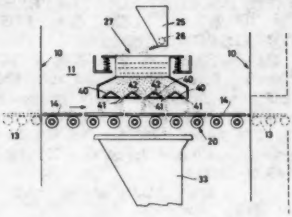
Filippo Marazzi, Sassuolo, Italy, assignor to Ceramica Filippo Marazzi S.p.A.

Filed Jun. 9, 1987, Ser. No. 61,108

Claims priority, application Italy, Aug. 1, 1986, 21363 A/86

Int. Cl.[4] B05C *19/00*

U.S. Cl. 118—308 **13 Claims**



1. An apparatus, for applying glaze in granular form to tiles maintained at a high temperature, comprising a tile conveyance system above which is a glaze dispenser unit, wherein the dispenser unit comprises at least an elongated glaze pouring edge which extends proximal to, and in a manner substantially transversal to, a path along which the tiles travel and which includes a terminal edge of an inclined surface, and means for depositing glaze on said inclined surface, the inclined surface comprising a forced-circulation cooling system which is located between the conveyance system and the dispenser unit so that the glaze when in said glaze dispenser unit is unaffected by said high temperature.

4,798,165

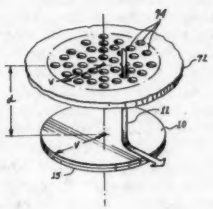
APPARATUS FOR CHEMICAL VAPOR DEPOSITION USING AN AXIALLY SYMMETRIC GAS FLOW

Wiebe B. deBoer, Amersfoort, Netherlands; Klavs F. Jensen, Minneapolis, Minn.; Wayne L. Johnson, Phoenix, Ariz.; Gary W. Read, Chandler, Ariz., and McDonald Robinson, Paradise Valley, Ariz., assignors to Epsilon, Tempe, Ariz.

Continuation of Ser. No. 784,738, Oct. 7, 1985, abandoned. This application Jan. 25, 1988, Ser. No. 147,100

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—715 **11 Claims**



1. Apparatus for deposition of material onto a substrate, comprising:

a circular substrate; and

an apparatus for directing a flow of gas carrying a deposition material perpendicular to the circular substrate, said appa-

ratus comprising a member having a plurality of gas flow apertures passing therethrough for maintaining said flow of gas perpendicular to said substrate and creating a stagnation point flow at a center of said circular substrate, said member being disposed parallel to said circular substrate and adapted so that a distance between said apparatus and said circular substrate may be varied, said plurality of gas flow apertures being disposed in a generally circular configuration having a radius substantially equivalent to a radius of said circular substrate wherein said plurality of gas flow apertures and said circular substrate are coaxially aligned such that said flow of gas generally has an axial symmetry with respect to the center of said substrate.

4,798,166

APPARATUS FOR CONTINUOUSLY PREPARING A LIGHT RECEIVING ELEMENT FOR USE IN PHOTOELECTROMOTIVE FORCE MEMBER OR IMAGE-READING PHOTOSENSOR

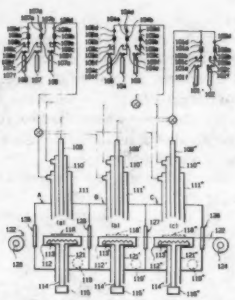
Masaaki Hirooka, Toride; Shunichi Ishihara, Ebina; Junichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 943,756

Claims priority, application Japan, Dec. 20, 1985, 60-287347; Dec. 21, 1985, 60-288213

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—719 **2 Claims**



1. An apparatus for continuously preparing a light receiving element comprising a substrate and a silicon-containing non-single-crystal semi-conductor layer formed by chemically reacting a first gaseous substance, capable of being a constituent of the layer but essentially incapable of contribution to the formation of the layer in its original energy state, and a second gaseous substance capable of electronically oxidizing the first gaseous substance for use in a photoelectromotive force member or image-reading photosensor; said apparatus comprising a plurality of reaction chambers for forming respective constituent layers of the semiconductor layer, said reaction chambers being continuously connected to each other via opening and shutting gates and a substrate conveying belt moving through said reaction chambers; each of said reaction chambers having a film-forming space, a raw material gas feed means extending through an upper wall of the reaction chamber and opening into said film-forming space, an exhaust means provided at the bottom portion of the reaction chamber, and a substrate supporting means having an upwardly and downwardly shiftable arm for supporting the substrate through said substrate conveying belt, and an electric heater for heating the substrate; said gas feed means comprising a concentric triplicate conduit terminating adjacent the substrate; said concentric triplicate conduit having an inner gas transporting conduit for transporting the first gaseous substance and two surrounding gas transporting conduits for transporting the second gaseous substance and a third gaseous substance, respectively; each of said gas transporting conduits having a respective outlet, and the outlet of said inner gas transportation conduit being encircled by the two outlets of said two transportation conduits, forming a reaction region adjacent the substrate.

4,798,167

APPARATUS FOR PREPARING A PHOTOELECTROMOTIVE FORCE MEMBER HAVING A CONCENTRIC TRIPLICATE CONDUIT FOR GENERATING ACTIVE SPECIES AND PRECURSOR

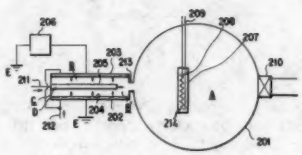
Shunichi Ishihara, Ebina; Keishi Saito, Nabari; Shunri Oda, Tokyo, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 843,304, Mar. 24, 1986, Pat. No. 4,689,093. This application May 1, 1987, Ser. No. 44,778

Claims priority, application Japan, Mar. 28, 1985, 60-64241

Int. Cl.[4] C23C *16/50*

U.S. Cl. 118—723 **7 Claims**



1. An apparatus for the preparation of a photoelectric conversion layer for a photoelectromotive force member comprising:

(a) a film-forming chamber having an inner space in which a substrate holder for a substrate is provided;

(b) an exhaust pipe connected to said film-forming chamber and through a main valve to an exhaust pump;

(c) a concentric triplicate conduit connected through a nozzle means to said film forming chamber; said concentric triplicate conduit comprising:

(i) an outer passage for introducing a gaseous raw material and being formed by a circumferential wall and an inner wall having a plurality of gas liberation holes;

(ii) a middle passage for applying microwave energy to said gaseous raw material to generate an active species and having a mixing region at the downstream side before the nozzle means, and

(iii) a central passage situated horizontally within said middle passage (ii) for introducing a gaseous precursor and for transporting said gaseous precursor toward the film-forming chamber and being open at an end positioned in the mixing region and leaving a predetermined distance to the nozzle means; said middle passage (ii) being formed by the inner wall of said outer passage and a circumferential wall of the central passage (iii);

(d) a feed pipe for introducing said gaseous raw material to said outer passage (i);

(e) a microwave power source for generating said microwave energy; and

(f) a feed pipe for introducing said gaseous precursor to said central passage (iii).

4,798,168

ARRANGEMENT FOR FARMING OF FISH, SHELLFISH AND OTHER MARINE BEINGS

Ragnar Vadseth, Gartnervn. 43, 3478 Naersnes, and Arne Vadseth, Vardevn. 26, 3470 Slemmestad, both of Norway

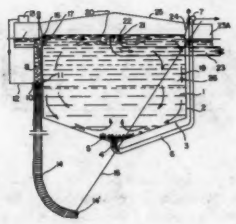
Filed Mar. 5, 1987, Ser. No. 22,714

Int. Cl.[4] A01K *63/04*

U.S. Cl. 119—3 **6 Claims**

1. A fish farming arrangement comprised of a liquid impervious enclosure for containing marine life, said enclosure being submerged in surrounding water, means attached to a curved

side wall of said enclosure for supporting said enclosure submerged within the surrounding water, and means for pumping water at a predetermined depth from said surrounding water into an upper portion of said enclosure tangentially to said curved side wall and in a horizontal plane, such that within said enclosure a constant circulating current is maintained against which said fish swim and position themselves in parallel



formation, said means for pumping water being comprised of a pump connected to a vertically-oriented hose having an inlet in a flexible end in said surrounding water and an outlet connected to said side wall, and a diffuser for injecting one or both of air and oxygen into water flowing within said hose, and further comprised of means disposed at the bottom of said enclosure for collecting debris and pumping said debris to a cleaning station for purification.

4,798,169

PLANT FOR FISH FARMING IN THE OPEN SEA

Johnny Rosén, Hölliviksnäs, and Pär Wulff, Falsterbo, both of Sweden, assignors to Triflex Biomarin AB, Trelleborg, Sweden

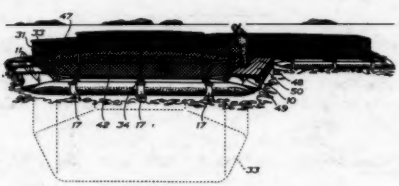
PCT No. PCT/SE85/00033, § 371 Date Oct. 2, 1985, § 102(e) Date Oct. 2, 1985, PCT Pub. No. WO85/03411, PCT Pub. Date Aug. 15, 1985

PCT Filed Jan. 28, 1985, Ser. No. 787,792

Claims priority, application Sweden, Feb. 2, 1984, 8400533-9

Int. Cl.[4] A01K *61/00*

U.S. Cl. 119—3 **9 Claims**



1. Plant for fish farming in the open sea, comprising a container of netting to be submerged into the water, a plurality of elongated tubular float bodies to be horizontally disposed on the sea surface, said bodies being closed at their ends, said ends having flattened end portions, means interconnecting the float bodies in pairs to form floating units, the float bodies of each pair extending in parallel one beside the other, the flattened end portions thereof extending substantially horizontally, and means interconnecting adjacent ends of the float bodies at said flattened end portions thereof for pivotal relative movement of the interconnecting float bodies about a substantially horizontal transverse axis, said connecting means being flexible to allow limited relative movement of the float bodies about the longitudinal axis thereof, said float bodies forming a closed configuration around the container of netting suspended therefrom.

4,798,170

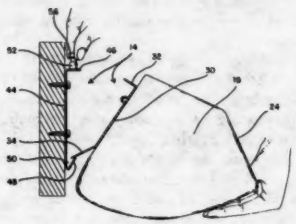
ANIMAL FEEDER

Edward F. DePiazzy, 1105 Mayberry Pl., Raleigh, N.C. 27609

Filed May 26, 1987, Ser. No. 53,716

Int. Cl.[4] A01K *5/01*

U.S. Cl. 119—61 **9 Claims**



1. An animal feeder comprising: a feed bowl; a mounting frame secured to said feed bowl and formed from a rectangular plate, the upper edge of said plate being bent along a line extending parallel to the upper edge thereof to form a perpendicular flange portion, said plate further being bent along a line extending parallel to the lower edge thereof to form an angled portion; a support frame formed from a rectangular plate for mounting on the wall of an enclosure, said support frame being bent along a line extending parallel to the upper edge thereof to form a second perpendicular flange portion, the lower edge of said support frame being turned upwardly to define an upwardly opening channel for receiving the angled portion of said mounting frame; said first flange portion being disposable adjacent said second flange portion when said angled portion of said mounting frame is inserted into said upwardly opening channel defined by said upturned portion of said support frame; and spring-biased retaining means for securing said first flange portion to said second flange portion when said angled portion of said mounting frame is inserted into the upwardly opening channel defined by the upturned portion of said support frame.

4,798,171

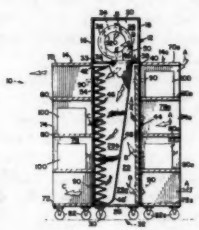
ANIMAL ISOLATOR

William F. Peters, Eden Prairie, and Randall C. Buchanan, Brooklyn Park, both of Minn., assignors to Nu Aire, Inc., Plymouth, Minn.

Filed Jul. 9, 1987, Ser. No. 71,414

Int. Cl.[4] A01K *1/03*

U.S. Cl. 119—15 **8 Claims**



6. An animal station comprising a filter cabinet having a plurality of walls defining an interior, said plurality of walls including a first vertical wall and a spaced apart second vertical wall having first and second openings therethrough, respectively, in air flow communication with said interior;

a first filter medium disposed to filter particulate matter from air flowing from said first opening;

a second filter medium disposed to filter particulate matter from air flowing through said second opening, said second filter medium selected to filter particulate matter finer than particulate matter filtered by said first filter medium;

said housing including an enclosed blower chamber having a blower disposed within said blower chamber, said chamber in air flow communication with an interior of said housing;

a pressure plenum connecting an outlet of said blower to said second filter medium with an inlet of said blower maintaining an interior of said housing on a suction side of said first filter medium at a pressure less than ambient pressure exterior of said housing;

at least one movable animal cage rack sized to abut said housing with an interior of said rack in air flow communication with either of said first opening and said second opening when said at least one rack is disposed in a first and second position, respectively, relative to said housing.

4,798,172

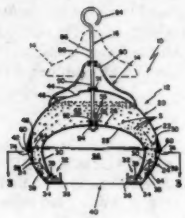
BIRDFEEDER

Stephen G. Clarke, Coventry, Conn., assignor to Clarke Products Co., Inc., Mansfield Depot, Conn.

Continuation-in-part of Ser. No. 860,053, May 6, 1986, abandoned. This application Sep. 16, 1986, Ser. No. 908,400

Int. Cl.[4] A01K *39/01*

U.S. Cl. 119—52 R **16 Claims**



8. A birdfeeder comprising:

a body extending along a vertical axis, said body having

an axially extending shell having upper and lower wall portions, said upper wall portion having a convexly curved exterior surface extending around said axis and toward said lower portion,

an axially extending wall means inside said shell, said upper wall portion of said shell and said wall means defining an axially extending reservoir therebetween, said lower wall portion of said shell and said wall means defining an axially extending chute therebetween,

a transversely extending feed tray inside said shell, said chute communicating between said reservoir and said tray, and

spacing means disposed between an inner surface of said lower wall portion and an outer surface of said wall means to maintain a space sufficient to allow seed to pass through said chute, and

an access opening in said lower wall portion of said shell, said access opening communicating between the exterior of said shell and said tray.

4,798,173

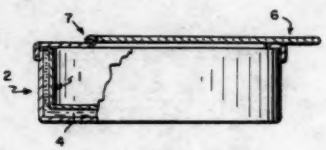
FREEZABLE PET DISH

Thomas J. Wilgren, 9 Battery St., Apt. No. 2, Boston, Mass. 02113

Filed Jul. 1, 1987, Ser. No. 68,458

Int. Cl.[4] A01K *7/00*

U.S. Cl. 119—61 **4 Claims**



1. A freezable pet dish for a pet food, comprising: a double walled container having an inner shell which has formed in the top surface thereof a concave depression adapted to contain a pet food, and an outer shell connected to the inner shell along the periphery of said concave depression to form an enclosed coolant space between the outer shell and the inner shell which substantially surrounds the concave depression on the bottom and sides thereof;

the outer shell being provided with a coating which has a lower heat conductivity than the outer shell thereby to prevent rapid heat gain from the surrounding environment;

coolant means contained within said coolant space for storing heat or cold; and

a cover for the concave depression including:

rim means adapted to mate with the double walled container for removably securing the cover to the double-walled container; and

a lid in the cover for providing access to a pet food in the depression and having a portion thereof adapted to be lifted by a pet;

at least a part of the lid being constructed from a transparent material so as to provide for disclosure of the dish's contents to a pet; and

the lid being connected to the rim means by a hinge and having an edge which protrudes beyond the periphery of the bowl so that the pet can lift the lid and gain entry to the bowl.

4,798,174

COLLAR FOR A PET

Yoshiya Tachi, Kuwana, and Noriyuki Hotta, Ikoma, both of Japan, assignors to Hotta Co., Ltd. (Hotta Kabushiki Kaisha), Osaka, Japan

Filed Jun. 17, 1987, Ser. No. 63,213

Claims priority, application Japan, Apr. 10, 1987, 62-55062[U]

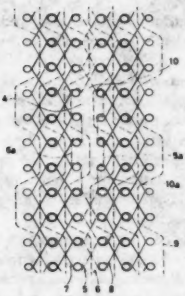
Int. Cl.[4] A01K *27/00*

U.S. Cl. 119—106 **4 Claims**

1. A collar for a pet comprising:

a belt-like collar proper, said collar proper having first and second ends, said collar proper being a warp-knitted fabric, said warp-knitted fabric having a plurality of only substantially unidirectional threads, at least one pair of said plurality of only substantially unidirectional threads being a pair of hole-defining chain stitches, each thread of said pair of hole-defining chain stitches being alternately interlocked and noninterlocked with the other thread of said pair of hole-defining chain stitches for defining a plurality of interlocked and noninterlocked segments along the length of said belt-like collar proper, each hole of said plurality of holes being defined by a non-interlocked segment of said plurality of interlocked and noninterlocked segments of said pair of hole-defining chain stitches;

a buckle attached at said first end of said belt-like collar proper; and



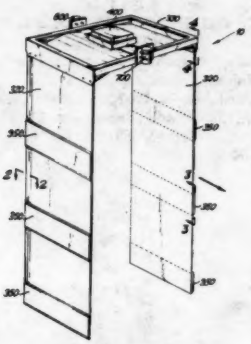
a pin having first and second ends, said first end of said pin being attached to said buckle, said second end of said pin being insertable into each said hole of said plurality of holes defined by said pair of hole-defining chain stitches.

4,798,175

ELECTRONIC IDENTIFICATION SYSTEM

Ted H. Townsend, Kansas City; Clinton L. Moore, Parkville, and John T. Machnicki, Kansas City, all of Mo., assignors to Alfa-Laval Agri, Inc., Kansas City, Mo.

Filed Oct. 9, 1986, Ser. No. 917,034
Int. Cl.[4] A01K *5/02*; G08B *13/24*
U.S. Cl. 119—155 **10 Claims**



1. An electronic identification system for identifying an object moving through a portal structure comprising:

at least one generating means for generating a multi-directional electromagnetic field in a plurality of different angular relations to the direction of movement of the object through the portal structure;

at least one first receiving means for attachment to the object for receiving and storing energy from the electromagnetic field;

at least one transmission means for attachment to the object for transmitting identifying data after the at least one first receiving means has received energy from the electromagnetic field;

at least one second receiving means for receiving the identifying data from the object; and

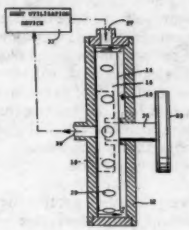
a flexible curtain secured to the portal structure, wherein the at least one generating means and the at least one second receiving means comprise an antenna loop secured to the flexible curtain.

4,798,176

APPARATUS FOR FRICTIONALLY HEATING LIQUID

Eugene W. Perkins, Rte. 1, Box 1837, Dawsonville, Ga. 30534

Filed Aug. 4, 1987, Ser. No. 81,312
Int. Cl.[4] F22B *3/06*
U.S. Cl. 122—26 **7 Claims**



1. Apparatus for heating liquid comprising:

a. an impeller for disposition within a closed housing defining a reservoir for containing a heat transfer liquid said impeller comprising:

i. a cylindrical rotor having external surface including a peripheral surface said external surfaces being arranged for frictional engagement with liquid in said housing;

ii. a central outlet cavity; and

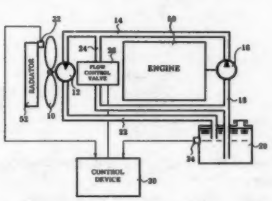
iii. fluid passages leading from said peripheral surface into said outlet cavity; said passages being arranged relative to the axis of rotation of said rotor that upon rotation thereof in a predetermined direction liquid is forced to flow from the peripheral surface of said rotor into said outlet cavity; and restricted orifices in said fluid passages to cause liquid to be heated as it flows through said passages into said outlet cavity.

4,798,177

SYSTEM FOR CONTROLLING ROTATIONAL SPEED OF HYDRAULICALLY DRIVEN COOLING FAN OF INTERNAL COMBUSTION ENGINE, RESPONSIVE TO ENGINE COOLANT AND ALSO FAN PROPELLANT TEMPERATURE

Seiji Oomura; Kashirou Fukami, both of Toyota; Masao Inagaki, and Tooru Hamamoto, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Nov. 4, 1987, Ser. No. 116,340
Claims priority, application Japan, Nov. 12, 1986, 61-268938
Int. Cl.[4] F01P *7/02*
U.S. Cl. 12.3—41.12 **1 Claim**



1. In a system for controlling the rotational speed of a hydraulically driven cooling fan for an internal combustion engine, the fan being driven by a flow of propellant hydraulic

fluid, the system including (a) means for sensing a value representing an operating temperature of the engine; (b) means for sensing an operating temperature of the propellant hydraulic fluid; and (c) means for controlling the flow of propellant hydraulic fluid so as to increase the rate of flow of propellant hydraulic fluid when said means for sensing the value representing the operating temperature of the engine indicates increased operating temperature of the engine, and also for increasing the rate of flow of propellant hydraulic fluid when the means for sensing the operating temperature of the propellant hydraulic fluid indicates increased operating temperature of the propellant hydraulic fluid, wherein said means for controlling the flow of propellant hydraulic fluid comprises

means for coordinating a second quantity with the operating temperature of the propellant hydraulic fluid; and

means for multiplying said first and second quantities to determine the rate of flow of propellant hydraulic fluid, wherein said means for coordinating the second quantity with the operating temperature of the propellant hydraulic fluid performs the coordination so that the second quantity is a relatively low constant value when the operating temperature of the propellant hydraulic fluid is below a relatively low first temperature, increases uniformly in accordance with increasing temperature of the propellant hydraulic fluid from said first temperature up to a relatively high second temperature, and is a relatively high second constant value when the temperature of the propellant hydraulic fluid is above said second temperature.

4,798,178

COMPOUND CAMSHAFT AND METHOD OF MANUFACTURING THE SAME

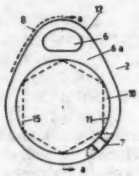
Walter Greulich, Uhwiesen; Karl Gut, Benken; Klaus Hornung, Stein am Rhein, all of Switzerland, and Günther Schulte, Volkertshausen, Fed. Rep. of Germany, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

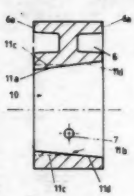
Filed Feb. 27, 1986, Ser. No. 833,558

Claims priority, application Switzerland, Mar. 6, 1985, 1009/85

Int. Cl.[4] F01L *1/46*; F16H *53/00*

U.S. Cl. 123—90.6 **46 Claims**





1. A method of manufacturing a compound camshaft comprising the steps of:

casting a predetermined number of elements;

pre-fabricating a camshaft body;

said step of casting said predetermined number of elements entailing the step of providing each said cast element with an opening and an internal contour having a predetermined axial length which bounds said opening which is configured over at least a predeterminate portion of said predetermined axial length in accordance with the type of connection to be made between said element and said camshaft body;

said internal contour of each one of said cast elements not being mechanically treated at least over a predominant portion of said internal contour;

said internal contour of each one of said cast elements and when seated upon said camshaft body being situated in sufficiently close proximity to said camshaft body so as to define an intervening space extending substantially over the predetermined axial length of the cast element providing a capillary action for a bonding agent for fixedly connecting said predetermined number of cast elements with said camshaft body;

placing a bonding agent at one end region of said intervening space of each of said predetermined number of cast elements for fixedly connecting said predetermined number of cast elements with said camshaft body; and

fixedly connecting said predetermined number of cast elements with said camshaft body by means of said bonding agent by causing said bonding agent placed at said one end region of said intervening space of each of said predetermined number of cast elements to flow towards an opposite end region thereof along the predetermined axial length of each cast element under the effect of said capillary action at the region of said internal contour of each one of said cast elements which have not been mechanically treated at least over said predominant portion of said internal contour.

4,798,179

HYDRAULIC OIL FOR USE IN SEALED-TYPE, LASH ADJUSTERS

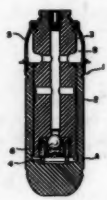
Masayasu Sakata, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1987, Ser. No. 62,889

Claims priority, application Japan, Jun. 17, 1986, 61-140878

Int. Cl.[4] F01L *1/14*

U.S. Cl. 123—90.52 **3 Claims**



1. A sealed-type lash adjuster comprising:

body means;

plunger means;

diaphragm means cooperating with said body means and plunger means to define an oil cavity; and

hydraulic oil filling said cavity, said hydraulic oil being engine oil based and comprising

mineral oil as a principal component, and

3% or less by weight of an additive which includes at least one of

an anti-oxidant,

a detergent-dispersant,

a rust preventive, and

an anti-foaming agent.

4,798,180

SELF-CONTAINED HYDRAULIC LASH ADJUSTER

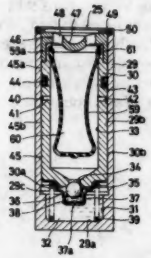
Yoshio Okabe; Fumio Arai, both of Kariya, and Hisashi Kodama, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Dec. 5, 1980, Ser. No. 213,519

Claims priority, application Japan, Dec. 17, 1979, 54-175133[U]

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.58 2 Claims



1. A self-contained hydraulic lash adjuster comprising

a cylinder member having a closed end portion,

a plunger slidingly mounted in said cylinder member,

a reservoir chamber located in said plunger,

a pressure chamber defined between said plunger and said closed end portion of said cylinder member,

a check valve for allowing fluid flow only from said reservoir chamber to said pressure chamber through a passage in said plunger,

a return spring stretched between said plunger and said closed end portion of said cylinder member for urging said plunger in the upward direction,

a leakage clearance formed between an inner surface of said cylinder member and an outer surface of said plunger,

a first annular groove provided on said outer surface of said plunger,

radial hole means extended through said plunger in communication with said first annular groove to connect said leakage clearance to said reservoir chamber,

a second annular groove provided on said outer surface of said plunger above said first annular groove,

a sealing member fitted in said second groove for providing fluid-tight seal between said plunger and said cylinder member,

said sealing member having a first pair of lips facing outwardly of said second groove with each of said first pair of lips having an edge portion in contact with said cylinder member and the combined width of said first pair of lips being less than the width of said groove,

said sealing member having a second pair of lips facing inwardly of said second groove with the combined width of said second pair of lips being greater than the width of said second groove,

a seat member for closing an open upper end portion of said plunger and for transmitting the thrust of a push rod to said plunger,

an elastomeric bag member having a generally tubular shape with a closed bottom end and an open upper end portion, an interior of said bag member being normally disposed in communication with atmospheric pressure through hole means in said seat member and an outer surface of said bag member in fluid contact with operating fluid in said reservoir chamber, and

a metal ring fixedly mounted in said open upper end portion of said bag member for fixing said open upper end portion of said bag member to an upper end portion of said reservoir chamber.

4,798,181

VALVE GUIDANCE FOR AN EXHAUST GAS VALVE OF AN INTERNAL COMBUSTION ENGINE

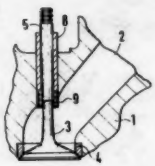
Michael Beer, Wimsheim; August Hofbauer, Pforzheim, and Erwin Knoll, Weissenborn, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.f. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1987, Ser. No. 30,564

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3610534

Int. Cl.[4] F01L *3/08*

U.S. Cl. 123—188 GC 14 Claims



1. A valve guidance for a disk valve of an internal combustion engine used for the control of an exhaust gas channel, comprising a guide body means having good heat-conducting and slide properties for the valve stem of the disk valve longitudinally guided in said guide body means, the guide body means having a hard metal coating means which defines an uninterrupted cylindrical surface therewith in the area thereof protruding into the exhaust gas channel for scraping oil carbon from said valve stem.

4,798,182

PORTABLE ENGINE

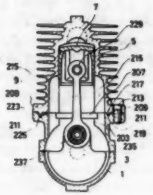
Takanori Ebinuma; Hiroshi Kato, and Mituko Sakurai, all of Tokyo, Japan, assignors to Komatsu Zenoah Co., Japan

Division of Ser. No. 917,033, Oct. 9, 1986, Pat. No. 4,744,337. This application Mar. 6, 1987, Ser. No. 22,887

Claims priority, application Japan Nov. 12, 1985, 60-172940; 60-172942; Nov. 27, 1985, 60-181460

Int. Cl.[4] F02F *7/00*

U.S. Cl. 123—195 R 6 Claims



1. A portable engine including an engine cylinder having a cylinder flange and a crankcase having a crankcase flange, said cylinder flange being held on said crankcase flange by bolts, comprising:

positioning pieces cast integrally with the cylinder flange of said engine cylinder; and

positioning holes cast integrally with the crankcase flange of said crankcase, said positioning holes of said crankcase flange receiving said positioning pieces of said cylinder flange respectively, to accurately position said crankcase with respect to said engine cylinder when said engine cylinder and said crankcase are assembled in such a man-

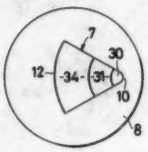
ner that said cylinder flange and said crankcase flange are fitted face to face, wherein positioning between the cylinder flange and the crankcase flange is performed not only in the radial direction but also in the circumferential direction of said flanges.

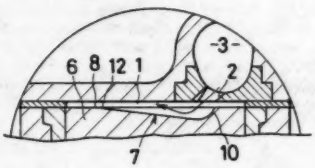
4,798,183

SWIRL CHAMBER TYPE COMBUSTION CHAMBER FOR DIESEL ENGINE

Kiyoshi Hatsura, and Masahiro Nagahama, both of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed May 21, 1987, Ser. No. 53,338
Claims priority, application Japan, May 23, 1986, 61-119682
Int. Cl.[4] F02F *3/26*
U.S. Cl. 123—279 **15 Claims**





1. In a swirl chamber type combustion chamber for a Diesel engine having a swirl chamber connected to a main combustion chamber through an injection passage provided at an offset position with respect to the main combustion chamber for injecting combustion gas into said combustion chamber, said injection passage having right and left sides, an inlet opening into said swirl chamber and an outlet, the longitudinal axis of said passage being directed obliquely to the main combustion chamber, the right and left sides of said injection passage being formed so as to gradually spread the lateral portions of the stream of combustion gas, expanded in the swirl chamber, at an angle gradually spreading towards the main combustion chamber, comprising: a piston head in said chamber defining a concavity which guides the stream of combustion gas injected from the swirl chamber into the main combustion chamber at the top dead center of the piston stroke, said concavity being formed in a substantially triangular configuration with an inlet end and an outlet end and configured spreading right and left progressing from the inlet end to the outlet end thereof, the inlet end of said concavity being located to face the outlet of the injection passage.

4,798,184

EXTENDED EXPANSION DIESEL CYCLE ENGINE

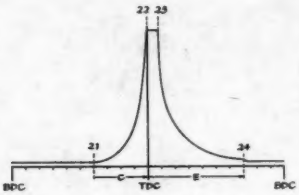
Sandor Palko, P.O. Box 8139, Honolulu, Hi. 96830-0139

Filed Nov. 17, 1986, Ser. No. 931,536
Int. Cl.[4] F02D *39/06*; F01L *1/44*
U.S. Cl. 123—316 **13 Claims**

1. An extended expansion method of operating a diesel cycle engine, said engine including at least one reciprocating piston-cylinder-combustion chamber-fuel injection means-venting valve means system, said method of operation comprising;

operating said venting valve means and valve timing means to provide air venting communication from said combustion chamber by maintaining said venting valve means in an open position during an initial portion of the compression stroke, as said piston travels in said cylinder from bottom dead center toward top dead center, until said piston reduces the cylinder swept volume to a predetermined pre-compression swept volume which is no less than substantially one-third of the work producing expansion swept volume of said engine and no greater than substantially five-sixths of said work producing expansion swept volume;

closing said venting valve means when said cylinder swept volume has been reduced to said predetermined pre-compression swept volume, thus sealing said combustion chamber, so that said piston is enabled to perform adiabatic compression of the air in said combustion chamber on the remainder of said compression stroke, the minimum



combustion chamber volume being limited with respect to said predetermined pre-compression swept volume so as to ensure a substantial compression ratio essential for compression ignition in said diesel cycle engine;

providing fuel injection timing for operating said fuel injection means to commence delivery of fuel into said combustion chamber when said piston is substantially at top dead center of said compression stroke, and to continue delivery of fuel for a predetermined period thereafter, substantially until conditions sustain rapid burning of the injected fuel, said work producing expansion swept volume providing said extended expansion for the combustion gases, as said piston travels toward bottom dead center; and

commencing exhaust discharge when said piston has reached the limit of said expansion swept volume, marking the end of the work producing expansion and the start of the respective aspiration means for said engine.

4,798,185

STRESS-LIMITING FLEXIBLE THROTTLE LEVER APPARATUS FOR A GASOLINE ENGINE DRIVEN POWER TOOL OR THE LIKE

Bernard M. Driggers, Shreveport, La., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Dec. 17, 1987, Ser. No. 134,223
Int. Cl.[4] F16C *1/10*
U.S. Cl. 123—400 **29 Claims**

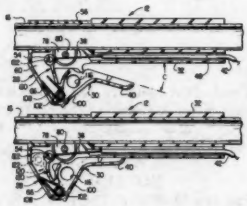
1. A control system comprising:

a controlled component having an operating member movable through an operating distance to control the operation of said component; and

actuating means for selectively moving said operating member through said operating distance, said actuating means including an actuating member having a body portion supported for movement relative to said operating member through a stroke distance and a flexible portion secured to said body portion and defining a portion of said actuating member, and substantially inextensible linkage means, interconnected between said operating member and said flexible portion of said actuating member, for

moving said operating member through said operating distance in response to movement of said actuating member through said stroke distance, said flexible portion being adapted to be resiliently flexed relative to said body portion when said flexible portion exerts a predetermined force on said linkage means during movement of said actuating member through said stroke distance,

said linkage means having a permissible dimensional tolerance range related to said stroke distance in a manner such that in at least a portion of said dimensional tolerance range said stroke distance is greater than that required to move said operating member, via said linkage means, through said operating distance and movement of said actuating member through said stroke distance causes said flexible portion of said actuating member to exert said predetermined force upon said linkage means, thereby causing said flexible portion to resiliently flex relative to said body portion in a manner limiting the actuating force transmitted through said linkage means to a predetermined magnitude, whereby the maximum actuation stresses imposable upon said actuating member body portion, said linkage means and said operating member by movement of said actuating member through its full stroke distance are automatically limited to predetermined magnitudes without the necessity of otherwise compensating for dimensional variations in said linkage means.



4,798,186

FUEL INJECTOR UNIT

Marco A. Ganser, Zürich, Switzerland, assignor to Ganser-Hydromag, Zürich, Switzerland

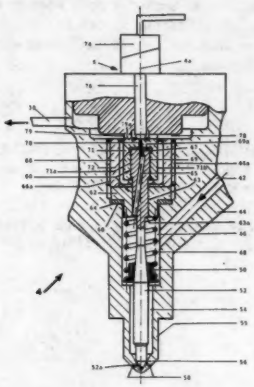
Filed Sep. 25, 1987, Ser. No. 100,949

Claims priority, application Switzerland, Sep. 25, 1986, 3836/86

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—467 **9 Claims**

1. Fuel injector for intermittently injecting fuel into the combustion chamber of an internal combustion engine (2), comprising a housing (44) with a valve seat (56) and at least one discharge orifice (58), an elongated injector valve member (52) provided with a piston member (60) and mounted within the housing (44) for engagement with the valve seat (56) for closing the discharge orifice (58), said injector valve member (52) being shiftable in its axial direction to be momentarily lifted from the valve seat (56) to open the discharge orifice (58) to allow for the injection of a desired quantity of fuel into the combustion chamber of the related internal combustion engine (2), a control chamber (72) being in connection with a fuel supply line (12, 42); the fuel pressure in said control chamber (72) acting upon the piston member (60) of said injector valve member (52) forcing the latter against said valve seat (56), means (67, 70, 74, 76) to quickly reduce and quickly restore the fuel pressure in said control chamber (72) to allow for the momentary axial movement of said injector valve member (52), said means to quickly reduce and restore the fuel pressure in said control chamber (72) comprising a first orifice (67) and a second orifice (70) communicating with one another and opening into said control chamber (72) and electromagnetically controlled valve means (76) for closing and temporarily opening one end of said second orifice (70); said valve piston (60) comprising a first, upper section (69) and a second, lower section (63) integral with said first, upper section (69), the outer diameter of the upper section (69) being bigger than the outer diameter of the second, lower section (63), said second, lower section (63) being guided with a close fit in said injector housing (44), said first, upper section (69) being surrounded by a member (71) and guiding said member (71) in a close fit, said first upper section (69) being movable relative to said member (71), said member (71) being unguided at its circumference (71*b*)and being provided with said second orifice (70), said control chamber (72) being defined by said member (71) and



the end surface (69*a*) of said first, upper section (69) of said piston member (60), said piston member (60) being provided with a bore (65) extending from the second, lower section (63) to the first, upper section (69), said bore (65) connecting at one end to said first orifice (67) provided in said first, upper section (69), and at the other end being in communication with a chamber (46, 54) provided in said housing (44), said chamber (46, 54) being connected to a high pressure fuel supply line (23, 42), the opening and closing motion of said injector valve member (52) being controlled by the pressure acting upon the bigger end surface (69*a*) of the first, upper section (69) and the smaller end surface (63*a*) of the second, lower section (63) independent of the fuel pressure in said chamber (46, 54).

4,798,187

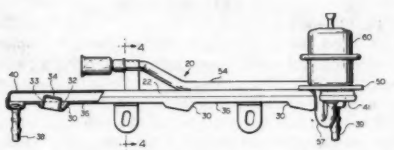
LOW PROFILE FUEL INJECTION RAIL

Sharon J. Hudson, Jr., Lambertville, Mich., assignor to Sharon Manufacturing Company, Lambertville, Mich.

Filed Nov. 7, 1986, Ser. No. 928,046

Int. Cl.[4] F02M *55/02*

U.S. Cl. 123—469 **16 Claims**



1. A low profile fuel injection rail assembly comprising: an elongated fuel rail beam having a plurality of spaced apart nodular sections connected in series by narrow tubular sections, each of said nodular sections having interior wall sur-

faces which define a fuel sump chamber having a bottom end, tubular fuel injector socket members projecting into said sump chambers from said bottom ends, each of said socket members having an open bottom entrance end for holding a top portion of a fuel injector in fluid tight communication with said sump chamber, said nodular sections and said sockets being formed such that the lower interior wall surfaces of each of said nodular sections and the exterior wall surfaces of each of said sockets jointly define an annular well which extends below the adjacent outer bottom surface portions of said narrow tubular members, fitments for connecting the fuel rail beam to a fuel supply system, and a stub section extending longitudinally from at least one end nodular section of said series, said stub section having a cross sectional open interior area which is larger than that of said tubular section and smaller than that of said nodular sections, and said fuel system connector fitments are attached thereto.

4,798,188

METHOD OF CONTROLLING INJECTOR

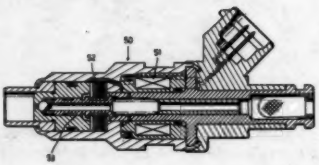
Shoji Ito, and Mikio Minoura, both of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Nov. 30, 1987, Ser. No. 126,638

Claims priority, application Japan, Dec. 4, 1986, 61-289603

Int. Cl.[4] F02M *51/08*; H01L *41/08*

U.S. Cl. 123—478 **4 Claims**



1. The method of controlling a fuel injector intermittently injecting liquid fuel to an engine comprising the steps of supplying a pulse signal to an actuator for reciprocating a valve body, varying the stroke of said valve body by a voltage signal applied to a stroke limiting member; changing the width of said pulse signal to thereby control the open time of said injector, and varying the voltage applied to said stroke limiting member to thereby control the stroke of said valve body.

4,798,189

FUEL INJECTION PUMP

Ian R. Thornthwaite, Gillingham, and Robert S. Bond, Maidstone, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

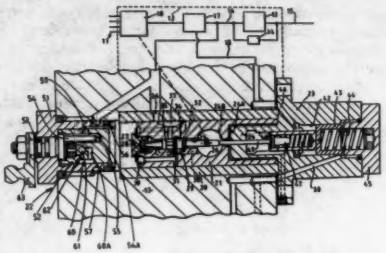
Filed Aug. 18, 1987, Ser. No. 86,893

Claims priority, application United Kingdom, Sep. 9, 1986, 8621668

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—502 **9 Claims**

1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising a pumping plunger located in a bore, cam means and cam follower means, a drive shaft coupled to one of said means for driving the cam means and cam follower means relative to each other to impart inward movement to the plunger in the bore, a piston member slidable within a cylinder, means for moving the piston member angularly within the cylinder and port means in the piston member and cylinder whereby in one angular position of the piston member in the cylinder the fluid pressures applied to each end of the piston member are equal and in an angular position the pressure applied to one end of the piston member will be higher than the fluid pressure applied to the other end of the piston member to cause said piston member to move



away from one end of the cylinder, and means transmitting the movement of said piston member to the other of said means.

4,798,190

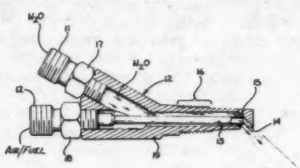
NOZZLE

Dale L. Vaznaian, and Michael J. Thermos, both of Huntington Beach, Calif., assignors to Nitrous Oxide Systems, Inc., Cypress, Calif.

Filed May 30, 1986, Ser. No. 868,938

Int. Cl.[4] F02M *69/08, 23/00*

U.S. Cl. 123—531 **21 Claims**



1. In an internal combustion engine, a device for introducing fuel and an oxidizing agent into a combustion chamber, wherein said oxidizing agent is under substantially greater pressure than said fuel, said device comprising:

a housing having first and second input ports and an output port, said housing having formed therein a cavity extending from the first input port to the output port, said first input port receiving therethrough said oxidizing agent and said second input port receiving therethrough said fuel, and a tubular fuel line connected at one end to said second input port, with its other end terminating adjacent to said output port such that said fuel is constrained to travel in said fuel line and is isolated from said cavity.

4,798,191

METHOD AND APPARATUS FOR HANDLING FUEL

Harvey M. King, Taylors, S.C., assignor to Robert A. Brown, Jr., Greenville, S.C.

Filed Jan. 15, 1988, Ser. No. 144,879

Int. Cl.[4] F02M *31/00, 31/10*

U.S. Cl. 123—557 **18 Claims**

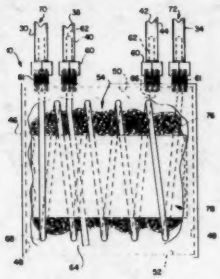
1. An apparatus for improving the combustibility of a liquid fuel prior to combustion thereof in an engine, the apparatus being supplied the liquid fuel from a fuel supply source, the apparatus comprising:

flow passage means for receiving the liquid fuel; said flow passage means defining a flow passage therethrough for carrying the liquid fuel and a fuel inlet in fluid communication with said flow passage, said fuel inlet being adapted for receiving liquid fuel from the fuel supply source;

a polytetrafluoroethylene material disposed within said flow

passage means for contact with the liquid fuel prior to the liquid fuel being supplied to the engine for combustion;

heating means associated with said flow passage means for heating the liquid fuel to a point below which causes the liquid fuel to vaporize; and



said flow passage means defining a fuel outlet in fluid communication with said flow passage, said fuel outlet being adapted for supplying the liquid fuel from said flow passage means after the liquid fuel has been exposed to said polytetrafluoroethylene material, said fuel outlet supplying the liquid fuel for subsequent combustion in the engine.

4,798,192

FAR-INFRARED RADIATING SYSTEM

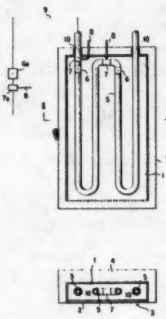
Saburo Maruko, Yamato, Japan, assignor to Nippon Chemical Plant Consultant Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,057

Claims priority, application Japan, Sep. 24, 1986, 61-223844

Int. Cl.[4] F24C *3/00*

U.S. Cl. 126—91 A **9 Claims**



1. A far-infrared radiating system comprising:

a primary-radiating element for radiating far-infrared rays having short wavelengths upon being heated, said primary-radiating element being a metallic conduit through which a catalytic-combustion-gas flow can pass to heat the same and a first far-infrared radiating element adhered closely to an outer periphery of said conduit, and

a secondary-radiating element comprising a metallic plate and a second far-infrared radiating element adhered to one surface of said plate, said secondary-radiating element having a wider surface area than that of said primary-radiating element and being spaced apart and oppositely disposed from said primary-radiating element,

wherein far-infrared rays having long wavelengths are radiated upon heating said secondary-radiating element by receiving said far-infrared rays having short wavelengths from said primary-radiating element.

4,798,193

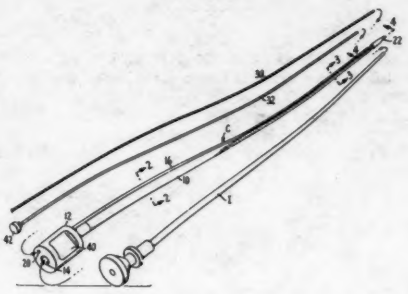
PROTECTIVE SHEATH INSTRUMENT CARRIER

Jerry D. Giesy, Portland, Oreg.; George D. Hermann, Palo Alto, Calif., and Matthew W. Hoskins, Beaverton, Oreg., assignors to Thomas J. Fogarty, Palo Alto, Calif.

Filed May 18, 1987, Ser. No. 51,862

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—7 **15 Claims**



1. A carrier for placing an instrument in a body passage to shield the passage from brasion by the instrument, said carrier comprising: an open ended sheath in the form of a thin flexible membrance collapsible upon itself, said sheath having an interior of a diameter greater than the cross-section of the instrument to be placed; guide wire accommodating means secured to said sheath to enable said sheath to be slid over a guide wire and into place within a body passage and isolate the guide wire from obstructing the passage of an instrument through the interior of the sheath; column strength imparting means operatively associated with the guide wire accommodating means to apply pressure thereto to draw the sheath along a guide wire and into a body passage within which the wire is placed.

4,798,194

MAGNETIC THERAPEUTIC DEVICE

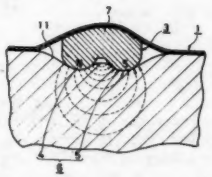
Shigeaki Amishima, Himeji, Japan, assignor to Aso Pharmaceutical Co., Ltd., Kikuchi, Japan

Continuation of Ser. No. 779,729, Sep. 24, 1985, abandoned. This application May 19, 1987, Ser. No. 953,523

Claims priority, application Japan, Nov. 12, 1984, 59-171834[U]

Int. Cl.[4] A61N *1/42*

U.S. Cl. 128—9 **11 Claims**



1. A magnetic therapeutic device comprising a sheet having a sticking surface, a permanent magnetic body having a first side and a second side, said first side being opposite to said second side, said first side being mounted on said sticking surface of said sheet, said second side being adapted to contact

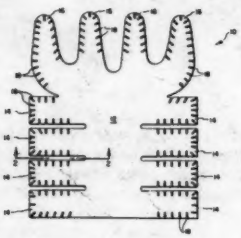
a human body part, said magnetic body having a first portion and a second portion, said first portion being defined partially by said first side and said second portion being defined partially by said second side, said first and second portions being disposed on opposite sides of a bisecting plane disposed generally midway between said first and second sides, said first portion being non-magnetized, said second portion being magnetized and containing a north pole and a south pole in side-by-side relationship and facing said second side such that said second side is thereby magnetized and substantially all of the magnetic lines of force from said magnetized second side pass outwardly of said second side, whereby substantially all of the magnetic lines of force from said permanent magnetic body pass outwardly of said second side and penetrate into said human contacting part.

4,798,195

MOLDABLE RETRACTOR FOR USE IN SURGERY

William J. Seare, Jr., 1321 Harvard Ave., Salt Lake City, Utah 84105

Filed Nov. 7, 1986, Ser. No. 928,539
Int. Cl.[4] A61B *17/02*
U.S. Cl. 128—20 25 Claims



1. A one-piece retractor for use in surgery comprising:
a generally planar plate constructed of a material capable of flexing having an interior body portion and at least two arms extending generally outwardly from said body portion wherein said arms are constructed of a material of a thickness capable of being positioned into a plurality of positions without renitency both within the plane of the plate and in various planes above or below the plane of the plate, said planar arms having a plurality of slots disposed along their outer edges such that surgical stays may be held within said slots.

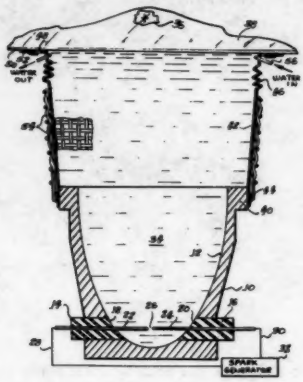
4,798,196

SHROUD FOR COUPLING KIDNEY STONE DISINTEGRATOR TO HUMAN BODY

Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Kildeer, both of Ill., assignors to Trutek Research, Inc., Lake Zurich, Ill.

Filed Dec. 16, 1986, Ser. No. 942,394
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—24 A 2 Claims

1. An extracorporeal kidney stone disintegrator comprising an upwardly opening ellipsoidal reflector having a first focus point therein and a second focus point disposed above the reflector, said reflector having an open upper end, means providing a spark gap in said reflector at the first focus point thereof, a flexible waterproof shroud fixed to said open upper end of said reflector having an outwardly extending integral peripheral flange at an upper end of said shroud, means securing and sealing said flange directly to the skin of a human body containing a concretion such as a kidney stone to be disintegrated, and a body of water filling said reflector and said shroud and in direct contact with the skin of said human body, said reflector being positioned relative to said body so that the concretion is at the second focus point of the reflector, generation of a spark across said spark gap causing generation of a shock wave focussed on said concretion and coupled to said



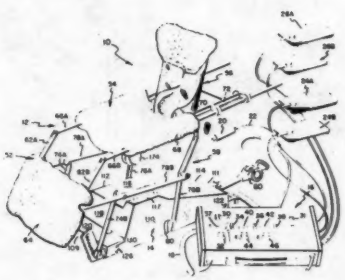
concretion by said body of water and by the tissues of said human body, and an external support surrounding and embracing said shroud.

4,798,197

SAFETY FEATURES FOR CONTINUOUS MOTION THERAPY SYSTEM

Robert H. Nippoldt, Newport; Gary A. Rocheleau, Maple Grove, both of Minn., and Thomas C. Wright, Longmont, Colo., assignors to Empi, Inc., Fridley, Minn.

Filed Mar. 10, 1987, Ser. No. 24,232
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 R 24 Claims



1. A continuous motion system for providing continuous motion therapy to a patient's limb, including:
a carriage for supporting a patient's limb;
drive means for driving the carriage through a range of reciprocal angular movement;
neuromuscular stimulation (NMS) means for applying electrical stimulation to muscles of the patient's limb; and
control means for controlling the drive means and the NMS means, the control means including:
ON/OFF switch means having ON and OFF states for controlling the application of power to the control means;
NMS switch means having ON and OFF states for controlling the NMS means; and

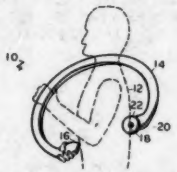
NMS safety circuit means coupled to the ON/OFF switch means, the NMS switch means and the NMS means for disabling the NMS means and thereby preventing the application of electrical stimulation when the ON/OFF switch means is is in its ON state until after the NMS switch means has been switched from its OFF state to its ON state.

4,798,198

BODY MASSAGER FOR ALTERNATIVELY APPLYING ROLLING PRESSURE OR DIRECT PRESSURE

William T. Wright, 41 Sandy Neck Rd., East Sandwich, Mass. 02537

Filed Jan. 7, 1988, Ser. No. 141,634
Int. Cl.[4] A61H *7/00, 15/00*
U.S. Cl. 128—57 3 Claims



1. A body massage apparatus for the selective application of two different kinds of pressure to portions of a user's body, which apparatus comprises:

(a) a circular, generally flat, body-encircling element having a circumference greater than about sixty percent (60%) of a circle and characterized by an opening therein to permit the placement of the trunk of the user's body within the body-encircling element, the body-encircling element having a one end and an other end;

(b) the said one end having end means tapered toward said opening to provide for the application of direct pressure to selected portions of the body of the user; and

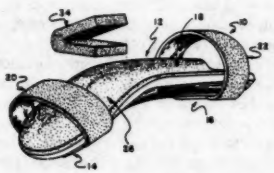
(c) the other end having a rotatable wheel means to provide for the alternative application of a rolling-type pressure to selected portions of the body of the user whereby the user places the trunk portion of his body within the body-encircling element, grasps the element with both hands and applies the one or the other end of the element against a selected body portion for the application of pressure thereto.

4,798,199

ARTERIAL WRIST SUPPORT

Vance M. Hubbard, and Welton K. Brunson, both of Bedford, Tex., assignors to Tecnol, Inc., Fort Worth, Tex.

Continuation of Ser. No. 579,774, Feb. 13, 1984, abandoned.
This application Jan. 21, 1986, Ser. No. 821,225
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 R 13 Claims



1. Apparatus for supporting a patient's hand, wrist, and at least a portion of the forearm in order to expose the radial artery to receive an arterial line, comprising:

a substantially rigid, unitary body adapted to underlie the posterior of the patient's hand, wrist and forearm, said body including:

a substantially concave, spoon-shaped forward portion for mating engagement with the posterior surface of the hand, between the wrist and the distal ends of the fingers, said concave shape extending upwards around the medial and lateral sides of the hand towards the anterior side thereof to prevent rotation of the hand about the wrist joint, and

a substantially concave forearm support portion being integrally connected to the end of said forward portion proximate the wrist for receiving the patient's forearm,

said forearm portion having a traversely arcuate channel formed therein and extending along said forearm portion from said forward portion at the wrist towards the elbow for receiving the portion of the patient's forearm cooperating with the wrist, the transverse shape of said forearm portion being concave for preventing rotation of the forearm about the wrist,

said forward portion and said forearm portion being of unitary construction,

said forward portion being oriented at an angle relative to said rear portion so that the patient's wrist is supported at an obtuse angle such that the hand is rotated about the wrist away from the anterior side to expose the radial artery to receive an arterial puncture; and

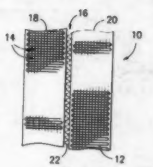
releasable fastening means for attaching said body to the hand and forearm to provide immobilizing support to the wrist and the arterial line, said fastening means comprising means for securing the palm of the hand below the thumb to said forward portion and means securing the forearm substantially above the wrist to said forearm support portion, a wrist region between said means for securing the palm and said means for securing the forearm remaining free for the insertion of said arterial line thereat.

4,798,200

SELF-ADHERING ORTHOPEDIC SPLINT

William P. Warthen, Spartanburg, and Mohammed I. Akhawala, Simpsonville, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 9, 1987, Ser. No. 130,588
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—89 R 6 Claims



1. A self-adhering, orthopedic splint capable of being conformed to the contours of a limb, which comprises: an elongated, inelastic, warp knit fabric having relatively stiff, inelastic monofilaments in the width direction and relatively flexible, inelastic yarns in the length direction, said monofilaments being interrupted by at least one hinged section running in the lengthwise direction; said fabric having firmly anchored to at least one surface thereof a layer of normally tacky, pressure sensitive adhesive.

4,798,201

SURGICAL ADHESIVE DRESSING

David A. Rawlings, Stansted Mountfitchet, and William D. Potter, Stortford, both of United Kingdom, assignors to Smith and Nephew Associated Companies p.l.c., United Kingdom

Continuation of Ser. No. 539,098, Oct. 5, 1983, abandoned. This application Dec. 30, 1986, Ser. No. 947,613

Claims priority, application United Kingdom, Apr. 13, 1983, 8309993

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.[4] A61L *15/00*

U.S. Cl. 128—156 19 Claims

1. A surgical dressing which consists essentially of a film which carries an adhesive layer for securing the dressing to the human body, wherein,

(a) the film is continuous and comprises a polyurethane polyether polyamide block copolymer or a polyether polyester block copolymer which in contact with water has a higher MVP than when in contact with moisture vapor but not water,

(b) the adhesive layer is porous such that the pores account for 10% to 50% of the area of the adhesive, and the adhesive allows access of water to the film when water is in contact with the adhesive layer so that,

(c) said surgical dressing has an MVP of not less than 2500 g/m^2 when the adhesive layer is in contact with water and has an MVP of not more than 2000 g/m^2 when the adhesive layer is in contact with moisture vapor but not water; whereby the dressing is suitable for use on exuding wounds and non-exuding wounds.

4,798,202

COMPRESSED-AIR BREATHING APPARATUS FOR UNDERWATER DIVING

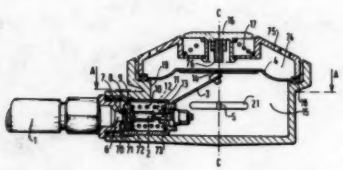
Bernard Chambonnet, Vence, France, assignor to La Spirotechnique Industrielle et Commerciale, Carros Cedex, France

Filed Feb. 12, 1987, Ser. No. 13,876

Claims priority, application France, Feb. 21, 1986, 86 02367

Int. Cl.[4] A62B *7/04*

U.S. Cl. 128—204.26 9 Claims



1. In a compressed air breathing apparatus, in particular for underwater diving, comprising an expansion chamber for expanding the compressed air, compressed air supply means, a valve through which said compressed air supply means communicates with said chamber, means for controlling the opening and closing of said valve responsive to an inhaling effort on the part of the user, a mouthpiece including a conduit for putting said expansion chamber in communication with said mouthpiece and consequently the mouth of the user, said conduit including means for forming an obstacle to the free flow of the air from said expansion chamber to the mouth of the user, said obstacle means being so arranged that a depression required for opening said valve is between −6 millibar and +6 millibar for a rate of flow of air of 400 liters/min; the improvement comprising means for bodily shifting the position of said obstacle means while maintaining the shape of said obstacle means thereby to alter the inhaling effort required of the user according to the bodily shifted position of said obstacle means.

4,798,203

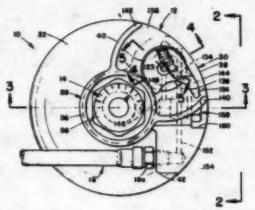
PORTABLE EMERGENCY BREATHING APPARATUS

Josef A. Bartos, Diamond Bar, Calif., assignor to Respirator Research, Ltd., Willoughby, Ohio

Continuation-in-part of Ser. No. 858,705, May 2, 1986, Pat. No. 4,724,833. This application Nov. 20, 1986, Ser. No. 932,562

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—205.22 40 Claims



1. Portable emergency breathing apparatus comprising, breathing gas supply container means having an axis, axially spaced apart open and closed ends, and cylindrical side wall means between said ends, housing means mounted on said open end of said container means, gas flow passageway means in said housing means having an inlet end in communication with the interior of said container means and an outlet end for connection to user utilization means, pressure gauge means in said housing means in communication with said passageway means between said inlet and outlet ends for measuring the pressure in said container means, indicator means for indicating the pressure of gas in said container means measured by said pressure gauge means, valve means in said housing means for opening and closing passageway means between said pressure gauge means and said outlet end to control the flow of gas from said container means to said outlet end of said passageway means, operating means for said valve means, said operating means including operating member means in part exterior of said housing means and manually displaceable between first and second positions to cause said valve means to respectively open and close said passageway means to flow therethrough, said housing means having axially outer and inner end surfaces with respect to said axis, said outer end surface providing said apparatus with an axially outermost end surface, said housing means having a radially outer peripheral side surface between said outer and inner end surfaces, said outer end surface including recess means therein, and said indicator means and said operating member means in said first and second positions thereof being supported in said recess means and axially within said outer end surface and radially within said outer peripheral side surface, whereby said indicator means and operating member means are protected from engagement with objects contacting said outer end surface and said outer peripheral side surface.

4,798,204

METHOD OF LASER-SCULPTURE OF THE OPTICALLY USED PORTION OF THE CORNEA

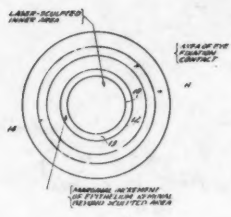
Francis A. L'Esperance, Jr., Englewood, N.J., assignor to LRI L.P., New York, N.Y.

Continuation-in-part of Ser. No. 049,333, May 13, 1987, which is a continuation-in-part of Ser. No. 748,358, Jun. 24, 1985, Pat. No. 4,665,913 Ser. No. 891,169, Jul. 31, 1986, and Ser. No. 891,285, Jul. 31, 1986, said Ser. No. 748,358, Pat. No. 4,732,148 is a continuation-in-part of Ser. No. 552,983, Nov. 17, 1983, abandoned, said Ser. No. 891,169, is a continuation-in-part of Ser. No. 780,335, Sep. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 740,276, Jun. 3, 1985, abandoned, which is a continuation of Ser. No. 552,983, abandoned, which is a continuation-in-part, said Ser. No. 891,285, is a continuation-in-part of Ser. No. 778,801, Sep. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 742,225, Jun. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 552,983,. This application Jul. 29, 1987, Ser. No. 80,398

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.[4] A61F *9/00*

U.S. Cl. 128—303.1 10 Claims



1. The method of improving optical properties of an eye by operating essentially only upon the optically used area of the anterior surface of the cornea of the eye, which method comprises a one-step procedure of tissue-ablating laser radiation of the anterior surface of the cornea in a volumetric removal of corneal tissue and with minimum depth penetration into the stroma and to a predetermined curvature profile, said step being one of selectively distributing the tissue-ablating radiation to exposed corneal tissue within said area to achieve the predetermined curvature profile essentially only by volumetric removal of Bowman's membrane tissue, and terminating said procedure upon achieving the predetermined curvature profile.

4,798,205

METHOD OF USING A SUBPERIOSTEAL TISSUE EXPANDER

Donald J. Bonomo, Olympia Field, Ill., and Robert C. Paulson, Goleta, Calif., assignors to Cox-Uphoff International, Carpinteria, Calif.

Division of Ser. No. 861,059, May 8, 1986, Pat. No. 4,719,918. This application Oct. 23, 1987, Ser. No. 113,228

Int. Cl.[4] A61M *29/02*

U.S. Cl. 128—344 8 Claims

1. A method for forming an enlarged subperiosteal channel along the alveolar ridge of the mandible or maxilla, comprising the steps of:

making an incision in the mucoperiosteum on the alveolar ridge;

creating a subperiosteal channel leading from said incision along the alveolar ridge;

introducing an expandable tube into said channel;

expanding said tube; and

leaving said tube in said channel until said mucoperiosteum has stretched or grown so that an enlarged channel remains after removal of said tube.

4,798,206

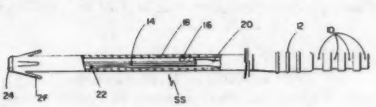
IMPLANTED MEDICAL SYSTEM INCLUDING A SELF-POWERED SENSING SYSTEM

David S. Maddison, Wollstonecraft; Michael Skalsky, Waverley; Zoran Milijasevic, Elanora Heights; Stephen G. Perry, Gisborne; Loraine K. Holley, Rockdale; Gerhard R. Gotthardt, Castle Hill, and Garry T. Richardson, Carlingford, all of Australia, assignors to Telectronics N.V., Curacao, Netherlands Antilles

Filed Oct. 28, 1986, Ser. No. 923,875

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 P 28 Claims



1. An implantable medical system for use in the control of the operation of a part of a body comprising:

control unit means for mounting in one location of a body;

control circuit means in said control unit means for controlling the operation of the control unit means;

battery means in said control unit means for supplying electrical energy to said control unit means and said control circuit means;

flexible lead means for mounting in said body and being connected to said control unit means and extending from said control unit means to another location inside said body;

said flexible lead means comprising a continuous flexible hollow tube having an outer and an inner surface;

stimulation electrode means mounted on said flexible lead means and being located in said another location for receiving electrical energy from said control unit means through said flexible lead means and applying electrical energy to said body at said another location;

self-contained, self-powered, flexible, electrical signal generating means mounted in a portion of said flexible lead means in spaced relationship to said stimulation electrode means for self-generation of electrical control signals solely by mechanical movement induced solely by flexible movement of said flexible lead means in said another location caused by action of and conditions in the body and without any electrical connection to and supply of electrical energy from any other source;

a fixed support secured to said inner surface;

said self-contained, self-powered, flexible, electrical signal generating means mounted for cantilever action on said fixed support; and

electrical control signal transmitting means, connected to said self-contained, self-powered, flexible, electrical signal generating means and said control circuit means, to transmit the generated electrical control signals to said control circuit means.

4,798,207

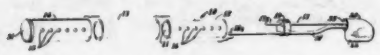
DEVICE FOR ENABLING TIME-INTEGRATED MEASUREMENT OF SUBSTANCES IN BIOLOGICAL FLUIDS

Stephen E. Wade, 1720 So. Marshall Rd., #50, Boulder, Colo. 80303

Division of Ser. No. 492,705, May 9, 1983, Pat. No. 4,594,326. This application May 2, 1986, Ser. No. 858,736

Int. Cl.⁴ A61B *5/00*

U.S. Cl. 128—632 **18 Claims**



1. A device for maintaining controlled diffusion of chemical substances of interest, comprising:

wall means defining a compartment, said wall means being provided with one of a diffusion port and diffusion ports of limited permeability, said ports providing a region which is generally permeable to diffusion of said chemical substances of interest, the remainder of said wall means of said compartment being substantially impermeable to diffusion of said chemical substances of interest, the distribution of the surface area of said ports being of a scattered nature such that no more than one-half of said surface area of said ports is contained in a square region as small as one-tenth of the entire surface area of said wall means.

4,798,208

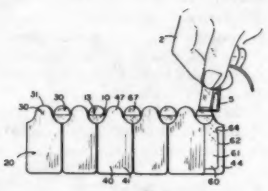
DIAGNOSTIC ELECTRODE

Adrian L. Faasse, Jr., 10499 Braska, SE., Middleville, Mich. 49333

Filed Dec. 9, 1987, Ser. No. 129,831

Int. Cl.⁴ A61B *5/04*

U.S. Cl. 128—640 **16 Claims**



1. A diagnostic electrode adapted to be affixed to a patient's body for medical testing, wherein said electrode comprises:

a flexible polymeric foam backing layer provided with a body and a tab portion projecting from one end thereof;

a tin foil layer provided with a body and a tab portion projecting from one end thereof, and bonded to said backing layer in an overlying relationship such that said tin foil tab portion overlies and is bonded to said backing layer tab portion to thereby define a tab of said electrode; and

a sticky conductive gel coated on and adhered to a first surfaces of said body of said tin foil layer for engaging the patient'body;

a lead clip, having teeth, gripping said tab potion of said polymeric foam backing layer and said tin foil tab portion, said foam backing layer being sufficiently soft and flexible that said teeth of said clip bite into and securely grip said foam backing layer at said tab to preclude accidental dislodging of said clip from said tab portion of said foam backing layer or said tab portion of said tin foil layer which is bonded to said foam backing layer tab portion.

4,798,209

METHOD AND APPARATUS FOR NON-CONTACTING IDENTIFICATION OF THE TEMPERATURE DISTRIBUTION IN AN EXAMINATION SUBJECT

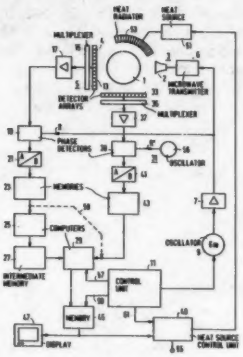
Klaus Klingenbeck, Hessdorf, and Rudolf Schittenhelm, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 9, 1987, Ser. No. 1,980

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1986, 3601983

Int. Cl.⁴ A61B *5/05*

U.S. Cl. 128—653 **23 Claims**



1. A method for non-contacting identification of a three-dimensional temperature distribution in a patient comprising the steps of:

subjecting said patient to microwave radiation having a phase and amplitude from a microwave source;

detecting the three-dimensional phase and amplitude of microwave radiation attenuated by said patient;

computing the three-dimensional dielectric constant distribution in said patient from the detecting three-dimensional phase and amplitude values;

computing the characteristic thermal radiation of a selected location of said patient from selected phase and amplitude values of microwave radiation attenuated by said patient; and

computing the three-dimensional temperature distribution of said patient from said three-dimensional dielectric constant distribution and said characteristic thermal radiation of said selected location.

4,798,210

THREE-DIMENSIONAL IMAGING SYSTEM

Robert S. Ledley, Silver Spring, Md., assignor to National Biomedical Research Foundation, Washington, D.C.

Continuation-in-part of Ser. No. 594,277, Mar. 28, 1984, Pat. No. 4,747,411. This application Sep. 29, 1986, Ser. No. 913,065

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—660.01 **9 Claims**

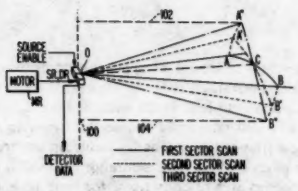
1. A three-dimensional imaging system for obtaining a three-dimensional image of a three-dimensional object, comprising:

source means disposed at a given point displaced from the three-dimensional object for performing a first sector scan of the three-dimensional object by transmitting ultrasonic energy from the given point toward the three-dimensional object in successive directions in a first scanning plane, each successive direction having an angular orientation,

with respect to a reference direction in the first scanning plane, which is greater than the angular orientation with respect to the reference direction of any preceding direction, one of the successive directions defining an axis between the given point and the three-dimensional object, said source means performing successive sector scans of the three-dimensional object of repeating the transmission of ultrasonic energy from the given point toward the three-dimensional object in successive directions in successive scanning planes, wherein each successive scanning plane has an angular orientation, measured along the axis and with respect to said first scanning plane, which is greater than the angular orientation of any preceding scanning plane as measured along the axis and with respect to the first scanning plane;

detector means for receiving reflected energy reflected from material of the three-dimensional object, and for converting said reflected energy to electrical signals; and

processor means connected to said detector means for receiving said electrical signals, and for processing said



electrical signals to develop reconstructed image data of the three-dimensional object, said processor means generating control signals;

wherein said detector means is disposed in an image plane displaced from the three-dimensional object, the image plane being perpendicular to the first scanning plane, the image plane being divided into a left image plane and a right image plane, said reconstructed image data developed by said processor means corresponding to forward projections of the three-dimensional object into said left image plane to form a first image and into said right image plane to form a second image, said first and second images forming a stereo pair;

said system further comprising processor-controlled rotating means connected to said processor means and responsive to said control signals from said processor means for rotating said source means about said axis by a certain angular value after each said sector scan is performed, and display means for displaying said first and second images compositely, thereby displaying said three-dimensional image of the three-dimensional object.

4,798,211

DIAGNOSTIC METHODS AND APPARATUS EMPLOYING MONITORING OF MYOCARDIAL ISCHEMIA

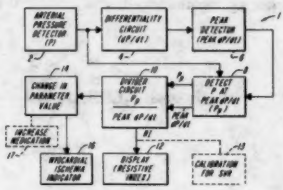
Daniel Goor, Rehov David Hemelech 47, Tel Aviv; Raphael Mohr, Rehov Hameshorer 10, Kiryat Kriniti, Ramat Gan, both of Israel; Ihsan A. Haddad, 375 Lexington Rd., Concord, Mass. 01742, and William R. Oliver, 13 Country Club Dr., Chelmsford, Mass. 01824

Filed Apr. 25, 1986, Ser. No. 856,502
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—668 **13 Claims**

1. A method for monitoring the onset of a myocardial ischemic event during the induction of anesthesia in a subject comprising the steps of

monitoring values of a parameter corresponding to systemic vascular resistance of the subject, and

detecting the onset of myocardial ischemic events during the induction of anesthesia when said monitored parameter



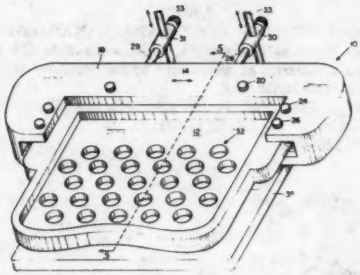
value changes in accordance with a selected numerical amount.

4,798,212

BIOPSY PADDLE WITH ADJUSTABLE LOCATOR PLATE

Thomas Arana, 89 Bloomfield St., Lexington, Mass. 02173

Filed Nov. 17, 1986, Ser. No. 930,918
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—749 **7 Claims**



1. An adjustable biopsy paddle for compressing tissue to be examined and assisting localization of a needle relative to a nonpalpable lesion, comprising:

a locator plate having a thickened rim and a plurality of tissue access holes of generally uniform diameter and generally uniform spacing between laterally adjacent holes;

a bracket for receiving and laterally, slidably supporting said plate; and

guide means including slot means located in said rim and pin means located on said bracket for engaging said plate with said bracket and constraining the direction of movement of said plate to the lateral direction and limiting the amount of lateral movement in said lateral direction.

4,798,213

BONE BIOPSY APPARATUS

Samuel H. Doppelt, 18 Wadsworth Rd., Sudbury, Mass. 01776

Filed Sep. 9, 1987, Ser. No. 94,503
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—754 **20 Claims**

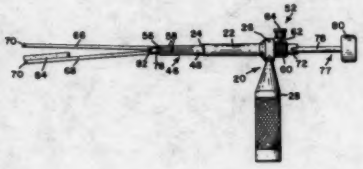
1. A drill for bone biopsy comprising:

(a) an outer cylindrical retaining sheath having a first open end and a second open end with cutting teeth,

(b) an inner cylindrical retaining sheath which is slidably mounted longitudinally within said outer retaining sheath, said inner retaining sheath having a first end and a second

open end with cutting teeth, said inner retaining sheath comprising two separable longitudinal halves,

(c) clamping means for releasably locking said inner and outer retaining sheaths together as a single drilling unit,



(d) means for rotating said drill about its central longitudinal axis, and

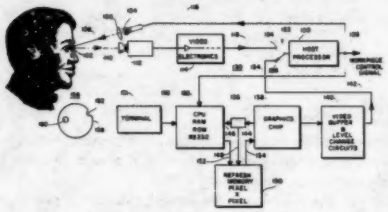
(e) means for removing said inner retaining sheath through the second open end of the outer retaining sheath.

4,798,214

STIMULATOR FOR EYE TRACKING OCULOMETER

Michael W. Haas, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 24, 1987, Ser. No. 125,633
Int. Cl.[4] A61B *13/00*
U.S. Cl. 128—745 **21 Claims**



1. Signal sourcing apparatus for actuating an eye tracking oculometer system, said apparatus comprising the combination of:

means for generating a first sequence of electrical signals representative of an artificial optical background area;

means for generating a second sequence of electrical signals representative of an artificial first optical image disposed on said background area;

means for generating a third sequence of electrical signals representative of an artificial second optical image disposable on either said first optical image or on said background area;

memory means including a plurality of memory elements, means for addressing said memory elements, and means for writing in said memory elements, for storing said first, second, and third sequence electrical signals;

means for reading said first, second, and third sequence of stored electrical signals in predetermined arrangement from said memory elements and for generating a composite video signal therefrom; and

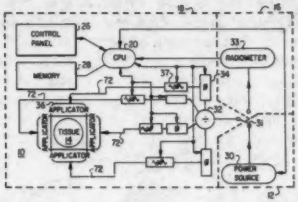
means for conveying said composite video signal to a data input port of said oculometer system.

4,798,215

HYPERTHERMIA APPARATUS

Paul F. Turner, North Salt Lake, Utah, assignor to BSD Medical Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 590,030, Mar. 15, 1984, Pat. No. 4,638,813, which is a continuation-in-part of Ser. No. 405,947, Aug. 6, 1982, Pat. No. 4,672,980, which is a continuation-in-part of Ser. No. 136,506, Apr. 2, 1980, Pat. No. 4,462,412. This application Nov. 28, 1986, Ser. No. 935,936
Int. Cl.[4] A61N *5/00*
U.S. Cl. 128—804 **16 Claims**



1. A hyperthermia treatment apparatus comprising:

a combined transmitter/receiver means for selective operation in a coherent heat mode and a coherent heat measuring mode, said combined transmitter/receiver means including a transmitter means for inducing electromagnetic energy in an electric field summing manner to a selected subcutaneous area of body tissue for heating, and a noninvasive receiver means for coherently combining blackbody radiation energy emitted from the selected subcutaneous area of the body tissue at depth indicating frequencies for measurement wherein the temperature of the selected subcutaneous area of body tissue being heated is monitored.

4,798,216

CLEANSING FLOSS FOR PIERCED EAR LOBES

John D. McCarty, and Linda M. McCarty, both of 13385 Dronfield Ave., Sylmar, Calif. 91342

Filed Feb. 19, 1985, Ser. No. 702,629
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—321 **7 Claims**

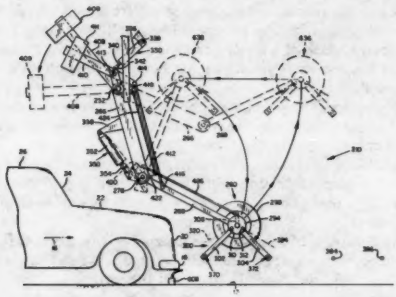
1. A method for cleaning and disinfecting pierced ear lobes comprising: providing an elongated floss-like member having sufficient rigidity to permit it to be inserted into and through the pierced ear lobe and having substantial absorbency; soaking the member in an astringent until it becomes impregnated with the astringent; and then inserting the member into and through a pierced ear lobe and pulling the member back and forth to clean and disinfect the ear lobe.

4,798,217

FRONT, TOP AND REAR APPLICATOR FOR A VEHICLE WASH

Daniel C. Hanna, 1133 SW. Rivington Dr., Portland, Oreg. 97201

Filed Oct. 1, 1986, Ser. No. 913,957
Int. Cl.[4] B60S 3/04
U.S. Cl. 134—57 R 13 Claims



1. A vehicle washing apparatus for cleaning an exterior surface of a vehicle as the vehicle moves along a travel path of movement, said apparatus comprising:

a cleaning element for cleaning said surface of said vehicle, said cleaning element being movable between a lower position in said path of movement and an upper position above said path of movement;

biasing means for biasing said cleaning element to said upper position;

power-operated cleaning element positioning means for moving said cleaning element independent of the bias of said biasing means toward and away form said surface;

at least one pivotal suspension member for supporting said cleaning element and moving said cleaning element between said lower and upper positions; and

a frame support to which said suspension member is mounted, said suspension member comprising a primary arm and a secondary arm, said primary arm being pivotally mounted to said support, said secondary arm being pivotally mounted to said primary arm, said cleaning element being mounted to said secondary arm for movement toward and away from said surface;

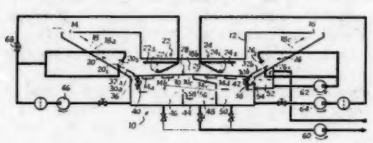
said biasing means being operable to move said cleaning element to a position above said path in the absence of power to said positioning means.

4,798,218

CLEANING APPARATUS FOR ELECTRONIC COMPONENTS AND/OR PRECISION PARTS OF MACHINERY

Gérard Sauvan, Cagnes sur Mer, France, assignor to Outillages Scientifiques et de Laboratoires O.S.L., Paris, France

Filed May 28, 1986, Ser. No. 867,766
Claims priority, application France, May 28, 1985, 85 07979
Int. Cl.[4] B08B 3/00, 3/12, 7/04
U.S. Cl. 134—74 7 Claims



1. Dual mode cleaning apparatus for selectively cleaning articles by a first spray cleaning mode, a second ultrasonic cleaning mode, or a combination of said first and second modes comprising, an enclosure having an inlet and an outlet, a conveyor extending through said enclosure from said inlet to said outlet for carrying said articles therethrough, a shallow solvent storing tank within said enclosure beneath said conveyor, said conveyor inclining downwardly from said inlet toward said solvent storing tank, extending generally horizontally across said tank, and including upwardly from said tank to said outlet, said tank having a bottom and opposite end walls, said end walls including portions inclining upwardly beneath said conveyor toward said inlet and said outlet, the top of said end wall at said inlet being lower than the top of said end wall at said outlet whereby solvent flows toward and over said inlet end wall counter to the displacement direction of said conveyor when said tank contains a bath of solvent in said second cleaning mode, means for cleaning said articles in said first mode including spray means positioned to spray solvent against said articles from above and below said conveyor, a solvent reservoir within said enclosure beneath said tank for receiving solvent dripping from said articles after being emitted from said spray means and solvent flowing over said inlet end wall, drain means in said tank for selectively draining solvent from said tank into said reservoir, and ultrasonic generator means disposed beneath said tank bottom for ultrasonically cleaning said articles moving through said bath of solvent within said tank in said second mode, said spray means including a final rinsing unit positioned over said upwardly inclining portion of said conveyor whereby solvent with the lowest impurities content drains onto the associated incline portion of the end wall and into the corresponding end of said tanks.

4,798,219

UMBRELLA PACKAGE

Liam Forde, Sungib Industrial Building, 20th Floor, Flats 3 & 4, 53 Wong Chuk Hang Road, Aberdeen, Hong Kong

Filed Oct. 16, 1986, Ser. No. 801,575
Int. Cl.[4] A45B 3/00, 25/18; B65D 65/00; A47F 13/06
U.S. Cl. 135—16 17 Claims

1. An umbrella package comprising:

a tube;

a cap closing one end of said tube;

a golf ball pick-up device at the other end of said tube such device comprising a cylindrical element extending coaxially from the tube with an annular resilient lip extending inwardly to a radius less than that of the tube, wherein the umbrella in collapsed form is housed within the tube; and

an opaque removable sleeve covering said tube.

4,798,220

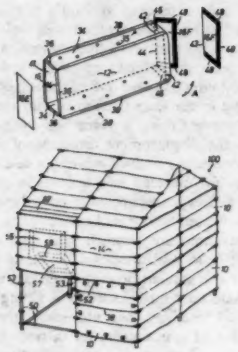
THERMO BLANKET

Dragomir Smoljo, Box 1285, Gravenhurst, Ontario, Canada POC 1JO

Filed Jun. 3, 1986, Ser. No. 870,181
Int. Cl.[4] B62D 63/04; E04B 1/34; E04D 1/34
U.S. Cl. 135—115 16 Claims

1. An insulating flexible panel capable of being releasably joined to like panels in adjacent side by side relationship for use with scaffold means, each said panel including spaced inner and outer surfaces joined to side surfaces so as to define an enclosure, one of said side surfaces including flap means, insulating bat material freely moveable into and out of said enclosure when said flap means is in an open position, and wherein

said insulating bat material fills said enclosure and is not stitched to said surfaces when said flap means is in a closed position, one of said inner or outer surfaces presenting a first border and a second border, said second border extending generally outwardly beyond said side surfaces so as to overlap



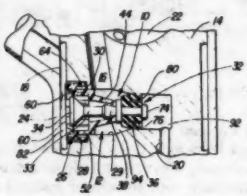
the first border of an adjacent panel, whereby said side surfaces of said panel and said adjacent panel engage said scaffold means therebetween and releasable fastening means associated with said first and second border for releasably fastening said first border of one panel to said second border of another panel.

4,798,221

SELF SEALING ANTI-KNOCK DIVERTER VALVE

Dennis W. Crawford, Pontiac, and Larry G. Turner, Clarkston, both of Mich., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Jul. 27, 1987, Ser. No. 78,382
Int. Cl.[4] F16K *11/02*
U.S. Cl. 137—119 12 Claims



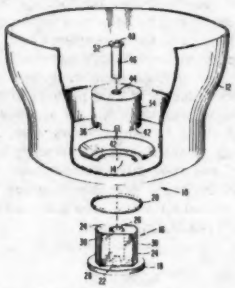
1. A diverter valve assembly for a faucet characterized by:
a valve seat member positionable in a valve chamber within a faucet body;
said valve chamber having a first outlet, a second outlet, and an inlet;
said valve seat having an integrally formed peripheral lip portion for sealingly abutting a side wall of said valve chamber between said inlet and said first outlet;
a valve element movably mounted to one of a closed or open position with respect to said valve seat such that when in said open position, fluid is allowed to flow from said inlet to said first outlet and when in said closed position, fluid does not flow from said inlet to said first outlet;
a pressure responsive means for moving said valve element between said closed and open positions with said pressure responsive means being responsive to a pressure differential between said inlet and said second outlet such that when a lower pressure is at said second outlet, said pressure responsive means moves said valve element to said closed position such that flow from said inlet is directed through said second outlet;
a resilient biasing means for biasing said valve element to said open position when the pressure at said second outlet is not lower than the pressure at said inlet by a predetermined amount;
said resilient biasing means including axially extending and resiliently flexible prongs depending from said valve seat member and having a second frictionally engaging a tapered surface of a spool connected to said valve element for biasing said spool and for damping motion of said spool;
said peripheral lip portion also abuts a shoulder in said valve chamber for axially positioning said valve seat in said chamber;
an annular recess located adjacent said peripheral lip portion and in communication with fluid pressure at said inlet to radially bias said lip portion outwardly against said side wall;
an end portion of said valve seat member toward said first outlet having circumferentially spaced notches therein to allow fluid flow radially outward therefrom,
said end portion abutable against a spout base of said faucet to fix the position of said valve member in conjunction with said lip portion and shoulder.

4,798,222

VALVE ASSEMBLY PARTICULARLY USABLE WITH A COFFEE BREWING BASKET

William Kauffman, 63 Robbinsville-Allentown Rd., Robbinsville, N.J. 08691

Filed Nov. 6, 1987, Ser. No. 118,070
Int. Cl.[4] A47J *31/02*
U.S. Cl. 137—132 15 Claims



1. A valve assembly, particularly usable with a coffee brewing basket having a brewing aperture defined therein, comprising:
a. a valve body member positioned immediately below the coffee brewing basket and adjacent the brewing aperture, said valve body member including:
1. a head section positioned below the coffee brewing basket adjacent the brew aperture defined therein, said head section being sealed with respect to the underside of the coffee brewing basket to prevent fluid flow therebetween, said head section defining an exit bore extending therethrough;
2. a main section integral with respect to said head section and extending upwardly therefrom through the brewing aperture defined in the brewing basket, said main section defining a central flow bore extending longitudinally therethrough and in fluid flow communication with respect to the interior of the brewing basket and

with respect to said exit bore defined in said head section, said main section including a threaded side section and at least one truncated side section;

b. a siphon cap means defining a central chamber therein, said siphon cap means including a threaded section adapted to be secured with respect to said threaded side section of said main section, said central chamber being positioned adjacent said truncated side section of said main section to define a siphon flow channel means, said siphon cap means defining slot means therein in fluid flow communication with respect to said siphon flow channel means and with respect to the interior of the brew basket, said siphon cap means further defining a main flow aperture in fluid flow communication with respect to said central flow bore of said main section; and

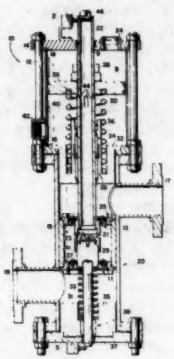
c. a main flow tube defining a main flow conduit extending therethrough, said main flow tube being positioned extending downwardly through said main flow aperture defined in said siphon cap means and through said central flow bore defined in said valve body member to facilitate movement of brewed coffee from the brew basket downwardly through said main flow aperture, said main flow conduit, said central flow bore and said exit bore.

4,798,223

DOUBLE BLOCK AND VENT VALVE SYSTEM

Richard A. Mitchell, and Joseph R. Buchanan, both of Portland, Conn., assignors to Skotch, Inc., Portland, Conn.

Filed Nov. 9, 1987, Ser. No. 118,602
Int. Cl.[4] F16K *1/44*
U.S. Cl. 137—312 **15 Claims**



1. A unitary valve assembly for use in the passage sage of fluids which may include volatile, flammable or poisonous gases, said valve assembly comprising:

a valve structure having an inlet duct and an outlet duct which controls the flow of fluid therein

an actuator structure connected with said valve structure for generating motion to said valve structure,

said valve structure including cage means interposed between said inlet and said outlet ducts, said cage having first and second annular shoulder members,

vent means operative within said cage means for purging residual gases remaining within said cage means and said outlet duct member,

shaft means operatively connecting said actuator structure with said valve structure, said vent means being integral with said shaft means and said shaft means including first and second shaft members,

each of said first and second shaft members being biased by separate biasing means,

said first shaft member being connected with first valve plug assembly means and said second shaft member being connected with second valve plug assembly means, each of said separate biasing means cooperative with said first and second shaft members and respectively biasing said first and said second valve plug assembly means into a closed sealing engagement with said respective first and said second annular shoulder members,

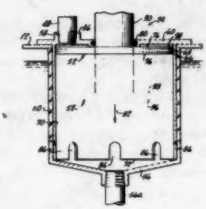
said first shaft member and said second shaft member being mechanically bridged by a receiver member outwardly extending from one end of said first shaft member and telescopically receiving an outwardly extending plunger member formed on one end of said second shaft member.

4,798,224

AUTOMATIC HOT WATER RECOVERY APPARATUS

Spencer K. Haws, Mesa, Wash., assignor to Alternative Energy Resources, Inc., Mesa, Wash.

Filed Jan. 29, 1988, Ser. No. 150,072
Int. Cl.[4] F16K *49/00*
U.S. Cl. 137—337 **16 Claims**



1. Water heater apparatus for use with a pressurized plumbing system having separate hot and cold water lines and conduit means, interconnected between the hot and cold water lines, for enabling cold water to pass from the cold water line into the hot water line, said water heater apparatus comprising:

tank means for containing a volume of water under pressure greater than atmospheric pressure, said tank means including an outlet configured for coupling to said hot water line;

heating means for heating water contained in said tank means; and,

water inlet means, having fitting means for coupling to a cold water supply line and said cold water line, for introducing water to and withdrawing water from said tank means, said water inlet means including piston means for displacing water within said tank means to both enable hot water, heated in said tank means, to flow into the hot water line from the tank means and hot water, from the hot water line, to return into said tank means, said water inlet means further including means for exerting atmospheric pressure on a portion of the piston means.

4,798,225

SEPERABLE VALVE ASSEMBLY INCLUDING A VALVE MOUNT AND A VALVE BODY

Hsin I. Hsiao, No. 120-1, Shin-Rong Road, Chiayi City, Taiwan

Filed Sep. 18, 1987, Ser. No. 99,340
Int. Cl.[4] F16K *51/00*
U.S. Cl. 137—454.2 **3 Claims**

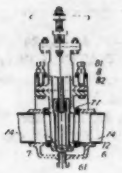
1. A separable valve assembly comprising;

a valve mount and a valve body, wherein said valve mount is structured in a concavity form defining two inclined inner planes oppositely disposed therein, each said inclined inner plane including a respective inclined surface part of said valve mount, and said valve body has two inclined surface parts defining two correspondingly contoured external planes of said valve body, said two inclined external planes of said valve body being in registry

with said two inclined inner planes of said valve mount, such that said valve body can be fitly wedged into said concavity of said valve mount,

a pair of fixing boards removably mounted on the top of said valve mount, with a valve body pushing bolt provided at the center of each said fixing board, each said valve body pushing bolt being used to push said valve body into tight engagement with said valve mount in assembly;

groove means on said valve body in the vicinity of said surface parts thereof;



sealing elements provided in said groove means for preventing leakage between said inclined surface parts of said valve body and said inclined surface parts of said valve mount in assembly; and

a valve-body lifting bolt placed at the bottom of said valve mount to abut against the bottom of said valve body, for pushing said valve body upward for separation of the two for disassembly when said valve-body lifting bolt is rotated to progress upward.

4,798,226

CHARGING VALVE

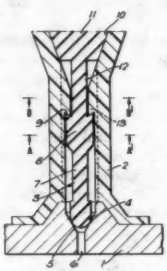
Helmut Struth, Ingelheim am Rhein, Fed. Rep. of Germany, assignor to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 154,725

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705363

Int. Cl.[4] F16K *15/14*

U.S. Cl. 137—512.4 **1 Claim**



1. A valve assembly, comprising:

a. a valve sleeve having a longitudinally running through bore;

b. a first valve seat at or near an inlet end of said bore;

c. a second valve seat at or near an outlet end of said bore; and,

d. a valve spindle in said bore, having a first end which is adapted to be pushed outwardly into sealing relationship with said first valve seat, a second end which is adapted to be pulled inwardly into sealing relationship with said second valve seat, an anchoring portion which is fixedly secured to the inside of said bore, a resiliently yieldable portion between said first spindle end and said anchoring portion which provides compressive stress for pushing said first spindle end into sealing relationship with said first valve seat, and a resiliently yieldable portion between said second spindle end and said anchoring portion which provides tensile stress for pulling said second spindle end into sealing relationship with said second valve seat.

4,798,227

VALVE FOR A PATIENT SUPPORT STRUCTURE

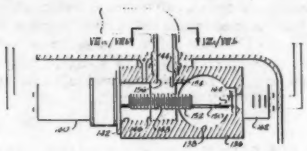
Vernon L. Goodwin, Charlotte, N.C., assignor to SSI Medical Services, Inc., Charleston, S.C.

Division of Ser. No. 814,610, Dec. 30, 1985, Pat. No. 4,745,647.

This application Apr. 28, 1987, Ser. No. 43,618

Int. Cl.[4] F16K *37/00, 31/04, 31/50*

U.S. Cl. 137—554 **14 Claims**



1. A multi-outlet, variable flow gas valve comprising:

(a) a housing defining an inlet and a passageway, said inlet communicating with said passageway;

(b) at least two cylinder chambers defined within said housing and communicating with said passageway, each said chamber having a longitudinal centerline therethrough;

(c) a discrete outlet defined in said housing for each said cylinder chamber and communicating therewith, said outlet being disposed perpendicularly to said longitudinal centerline of said cylinder chamber; and

(d) means for variably controlling communication of said inlet with each said outlet through said passageway and each said cylinder chamber, said variable communication control means comprising:

(i) a piston slidably received within each said cylinder chamber, said piston blocking all communication between each said outlet and said inlet when said piston is oriented at at least one predetermined location within said cylinder chamber, said piston permitting maximum communication between said outlet and said inlet through said cylinder chamber when said piston is oriented at another predetermined location within said cylinder chamber, said piston permitting a predetermined degree of communication between said outlet and said inlet through said cylinder chamber depending on the orientation of said piston within said cylinder chamber; and

(ii) means for orienting said piston at a predetermined location within said cylinder chamber, said means for orienting said piston comprising:

(i') a threaded opening extending through said piston and concentric with said longitudinal center line thereof;

(ii') a rotatable shaft having a threaded exterior portion engaging said threaded opening of said piston;

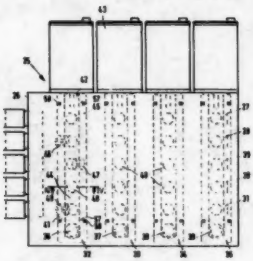
(iii') means for rotating said shaft whereby rotation of said shaft causes displacement of said piston along said shaft in said cylinder chamber, the direction of said displacement depending on the direction of rotation of said shaft; and

(iv') means for precluding full rotation of said piston, said rotation preclusion means comprising a projection associated with said piston and having a free end extending into each said outlet of said housing.

4,798,228
MULTI-LIQUID CONTROL VALVE SYSTEM, PARTICULARLY FOR FLEXOGRAPHIC INK OF DIFFERENT COLORS

Franz X. Gollinger, St. Peterstо, and Georg Bock, Augsburg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,212
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1986, 3638607
Int. Cl.[4] F16K *11/08*
U.S. Cl. 137—625.47 20 Claims



1. Multi-liquid control valve system to selectively control flow of differently colored printing ink, and washing liquid from a plurality of supply lines (11–14, 15) to a plurality of receiving lines (17–20, 21) for use in a multi-color printing machine having a plurality of printing systems or stations (1–4), each having a plurality of plate cylinders (16), and

means (24) for selectively applying printing ink of a selected color, or washing liquid, to respectively selected cylinders comprising

a valve housing (26);

a plurality of essentially parallel bores (32–35) formed in the housing;

a plurality of elongated faucet or cock or plug valve elements (41), one each located in a respective one of said bores (32–35),

and wherein

each of said valve elements (41) is formed with an axial bore (44),

and is further formed with a plurality of radial bores (45–48, 49), in fluid communication with said axial bore,

said radial bores being, each, axially staggered with respect to each other along said valve element (41);

a plurality of first fluid connection duct means (36–39) formed in the housing, each respectively hydraulically coupled to a respective axial bore (44) of a respective valve element (41);

a plurality of second fluid duct connection means (27–30, 31) formed in the housing;

a plurality of coupling ducts (40) formed in the housing and positioned for alignment with selected radial bores (45–48, 49) in the respective valve elements, for hydraulically coupling one of said plurality of the second fluid connection duct means (27–30, 31) for connection with a selected radial bore (45–48, 49) of the valve elements,

the radial bores (45–48, 49) of the valve elements (41) being circumferentially offset relative to each other;

means for connecting said first connection duct means (36–39) to one of said plurality of lines;

means for connecting said second connection duct means (27–30, 31) to the other of said plurality of lines; and

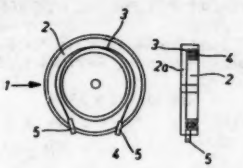
means (42, 43) for rotating said valve elements (41)

to selectively establish flow connection between selected supply lines and selected receiving lines by establishing a connection between a selected second fluid connection duct means (27–30, 31), a selected radial bore (45–48, 49) in the valve element (41), through a coupling duct (40) in alignment with the selected radial bore, the axial bore (44) in the valve element and one of the first connection ducts (36–39).

4,796,229
GAS FLOW CONSTRICTION MODULE

Börje Rantala, Helsinki, Finland, assignor to Instrumentarium Corp., Finland

Filed Feb. 12, 1987, Ser. No. 14,012
Claims priority, application Finland, Mar. 19, 1986, 861140
Int. Cl.[4] F15D *0/00*
U.S. Cl. 138—42 4 Claims

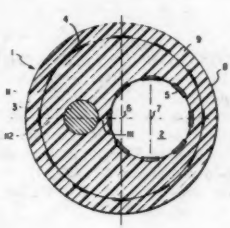


4. A gas flow constriction module for the distribution and control of a fluid in a respiratory monitoring device, comprising a body having a bottom and a side wall and defining and internal chamber, a thin plastic constriction tube disposed in coiled form within said chamber and supported by said bottom, said side wall having a pair of openings, a pair of rigid tubular connectors extending outwardly from said body and each having an internal passage communicating with the respective opening, the ends of the tube extending through the respective openings and disposed within the corresponding passages, and means for securing the ends of the tube within the passages of said couplings.

4,798,230
HEATABLE PLASTIC HOSE

Siegfried Hopperdietzel, Selb, Fed. Rep. of Germany, assignor to Rehau AG + Co., Rehau, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 88,963
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 8622603[U]
Int. Cl.[4] F16L *11/12*
U.S. Cl. 138—103 12 Claims



1. A heatable plastic hose for transporting fluids, said hose having only a single longitudinal cavity defined therein, comprising:

a tubular hose wall having a cross-sectional center point which defines, along the inner surface thereof, only a single longitudinal cavity having a cross-sectional center point which is laterally offset from the cross-sectional center point of the tubular hose wall, the tubular hose wall

having, in cross-section, a first wall portion and a second wall portion, the first wall portion being thicker than the second wall portion; and

a heating conductor wire which is longitudinally coextensive with and parallel to the tubular hose wall and is completely embedded in the first wall portion.

4,798,231

METHOD AND DEVICE FOR CONNECTING AT LEAST TWO RODS

Heinrich Glaus, Niederwangen; Peter Lehmann, Kirchdorf; Hans Joehr, Kehrsatz, and René Freiburghaus, Bern, all of Switzerland, assignors to Styner & Bienz AG, Niederwangen, Switzerland

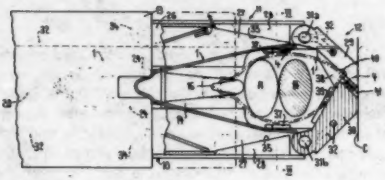
PCT No. PCT/CH86/00133, § 371 Date May 22, 1987, § 102(e) Date May 22, 1987, PCT Pub. No. WO87/01753, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 24, 1986, Ser. No. 67,740

Claims priority, application Switzerland, Sep. 24, 1985, 4115/85

Int. Cl.[4] B21F *15/04*

U.S. Cl. 140—119 21 Claims



1. A method for binding at least two rods, comprising the steps of:

providing a binding apparatus having a rotatable grabbing means;

providing a wire clamp having a pair of leg portion ends provided with complementary locking means;

positioning said wire clamp around the rods from a first side thereof whereby said leg portion ends extend to a second opposite side of said rods;

engaging said complementary locking means on said second side;

grasping said wire clamp from said first side with said grabbing means

rotating said grabbing means to thereby twist said wire clamp and bind said rods.

4,798,232

AUTOMATIC CONTROL SYSTEM FOR FILLING BEVERAGE CONTAINERS

William F. Stembridge, College Park; W. Frank Stembridge, East Point, both of Ga., and James C. Sturrock, Espanola, N. Mex., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 684,215, Dec. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 629,397, Jul. 10, 1984, abandoned. This application Feb. 9, 1987, Ser. No. 12,908

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—1 18 Claims

1. An apparatus for automatically filling a container with a beverage comprising:

(a) an ultrasonic energy transmitter for transmitting ultrasonic energy down toward a container supporting surface located below a beverage dispensing nozzle;

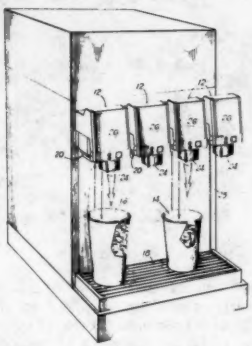
(b) an ultrasonic energy receiver, separate from and spaced apart from said transmitter and positioned for receiving ultrasonic energy reflected back up from the direction of said surface and for generating corresponding signals;

(c) control circuit means for automatically using said generated signals for detecting the presence of a container placed on said surface and below said nozzle;

(d) said control circuit means including means for controlling the filling of said container with beverage from said nozzle;

(e) said control circuit means including means for detecting said surface, a lip of a container placed on said surface, and one of a bottom of said container or the level of any ice in said container;

(f) said control circuit means including means for detecting a container lip and a second surface located at least 0.1 inch above said surface and also located at least 0.25 inch below said lip, prior to initiating the filling of a container located on said surface;



(g) said control circuit means including logic circuit means for generating a container lip signal indicative of the presence of a lip of a container only when two signals are received and are within 0.1 inch out of a set of five pulses;

(h) said logic circuit means also including means for generating a stable lip distance signal only when five consecutive container lip signals, separated by approximately sixteen milliseconds and that correspond to within 0.2 inch, have been detected; and

(i) said logic circuit means including means, after said stable lip distance signal has been received, for generating an ice level signal if an additional surface is detected that is more than 0.1 inch above said surface and that is also more than 0.25 inch below said lip.

4,798,233

PORTABLE COMPRESSED AIR DELIVERY UNIT FOR TIRES WITH BUILT-IN ANTIFREEZE CAPABILITY

Brian J. Mooney, 210 W. Jefferson, Grand Ledge, Mich. 48837

Filed Mar. 2, 1987, Ser. No. 20,727

Int. Cl.[4] B65B *31/00*

U.S. Cl. 141—38 4 Claims

1. In a portable compressed air delivery unit having a built-in antifreeze capability whereby an antifreeze liquid supply tank is adapted to selectively deliver an antifreeze vapor to the air compressor so that a compressed air-antifreeze vapor mixture is delivered from the air compressor to the flexible compressed air outlet tire delivery tube so as to prevent freeze-up of normal compressed air condensation therein during outdoor use in freezing weather, the combination comprising:

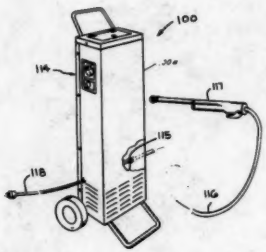
a portable support frame;

an air compressor provided on said frame, said air compressor having a compressor air intake assembly extending upwardly therefrom, said air intake assembly having an opening, said air compressor provided with an antifreeze vapor inlet between the opening of said air intake assembly and said air compressor, said air compressor provided

with an air compressor compressed air-antifreeze vapor mixture outlet;

an antifreeze liquid supply tank provided on said frame above said air compressor, said antifreeze liquid supply tank having a antifreeze liquid supply tank air intake assembly extending upwardly therefrom, said antifreeze liquid supply tank air intake assembly adapted to selectively introduce air into the lower portion of said antifreeze liquid supply tank beneath the surface of the antifreeze liquid contained in said supply tank, said antifreeze liquid supply tank provided with an antifreeze vapor outlet in the upper portion of said antifreeze liquid supply tank;

an antifreeze vapor delivery tube in operative engagement at one end thereof with said antifreeze tank vapor outlet, said antifreeze vapor delivery tube adapted for operative engagement at the opposite end thereof with said air compressor antifreeze vapor inlet so as to provide selective on demand delivery of antifreeze vapor to said air compressor;



a compressed air-antifreeze vapor mixture tire delivery tube provided in operative engagement at one end thereof with said air compressor compressed air-antifreeze vapor mixture outlet, said tire delivery tube provided with a tire-engaging compressed air valve assembly at the opposite end thereof for selective delivery of compressed air into a vehicle tire; and

a coin-operated timer assembly provided on said frame in operative electrical engagement with said air compressor, said coin-operated timer assembly provided with an external power cord adapted for selective engagement with an external electrical power source, said coin-operated timer assembly adapted to selectively actuate said air compressor so as to automatically draw antifreeze vapor from said antifreeze liquid supply tank into said air compressor so as to selectively deliver a compressed air-antifreeze vapor mixture through said tire delivery tube to said tire-engaging compressed air valve assembly for selective delivery to a vehicle tire so as to prevent freeze-up of normal compressed air condensation in said tire delivery tube during outdoor use in freezing weather.

4,798,234

CAN FILLING SYSTEM

Larry M. Dugan, Boulder, Colo., assignor to Adolph Coors Company, Golden, Colo.

Division of Ser. No. 881,649, Jul. 3, 1986, Pat. No. 4,718,465. This application Nov. 27, 1987, Ser. No. 126,112

Int. Cl.[4] B65B *35/10*

U.S. Cl. 141—165 **7 Claims**

1. A can filling system for minimizing damaged cans during filling comprising:

rotating filler wheel means having support means for supporting a plurality of cans, each of said cans having a longitudinal axis extending in a vertical direction;

each of said cans having a bottom portion, a body portion having a cylindrical outer surface, an open top rim portion and a neck portion between said body portion and said open top rim portion;

said cylindrical outer surface of said body portion having a lower portion and an upper portion;

said rotating filler wheel means transporting said cans in a horizontal circular path;

first pocket means on said rotating filler wheel means located adjacent to but spaced from said support means for positioning said cans on said support means;

said first pocket means having at least one arcuate surface having a longitudinal axis extending in a vertical direction;

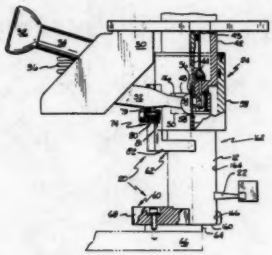
can filler units supported on said rotating filler wheel means each of said can filler units having a generally cylindrical outer surface having a longitudinal axis aligned with the longitudinal axis of said first pocket means;

each of said can filler units having tulip means having a cylindrical inner surface and mounted for reciprocation over said outer surface of said can filler units for moving into and out of sealing engagement with one of said cans on said support means;

said tulip means having a longitudinal axis aligned with said longitudinal axis of said first pocket means;

second pocket means for cooperating with said first pocket means in positioning said cans;

mounting means for mounting each of said second pocket



means on each of said tulip means for movement therewith;

said second pocket means having at least one arcuate surface having a longitudinal axis extending in a vertical direction and aligned with said longitudinal axis of said tulip means;

star wheel means for transporting said cans to said rotating filler wheel means;

star wheel pocket means for transferring each of said cans onto said support means said lower portion of said cylindrical outer surface in contact with said arcuate surface of said first pocket means and said upper portion of said cylindrical outer surface in contact with said arcuate surface of said second pocket means with portions of said longitudinal axis of each of said cans coinciding with said longitudinal axis of said arcuate surface of said first and second pocket means;

means for moving each of said tulip means into sealing engagement with each of said cans and at the same time moving said second pocket means over said outer surface of said each of said cans; and

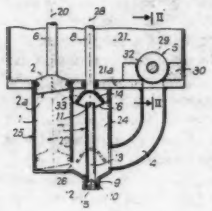
force applying means for applying a force to each of said cans during said movement of said tulip means and said second pocket means to maintain the contacting relationship between said upper and lower portions of said cylindrical outer surface of said can body and the arcuate surfaces of said first and second pocket means.

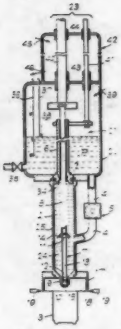
4,798,235

METERING AND DISPENSING DEVICE FOR THE PACKING OF LIQUIDS PRODUCTS

Roland Torterotot, Saint Arnoult en Yvelines, France, assignor to Societe a Responsabilite Limitee: Erca Holding, Les Ulis, France

Filed Jun. 4, 1987, Ser. No. 58,281
Claims priority, application France, Jun. 5, 1986, 86 08138
Int. Cl.[4] B67D *5/34*
U.S. Cl. 141—258 16 Claims





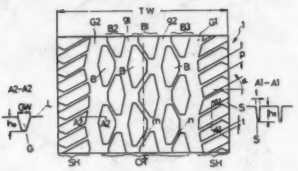
1. Metering and dispensing device for packing liquid products, such as food products, in pots or similar containers, comprising a reservoir for a product, metering means including a cylindrical metering chamber connected via an admission valve with said reservoir and a piston movable between high and low positions in said metering chamber, dispensing means equipped with a downwardly facing tubular nozzle, said nozzle having an upper inlet orifice and a lower ejection orifice and being movable longitudinally, said dispensing means including a dispensing chamber which communicates with the metering chamber and with the exterior of the device through the tubular nozzle, and a closing member operationally coupled to said nozzle, and actuating means for actuating the piston and the nozzle is such a way as to lower the nozzle before filling each container with liquid introduced via said nozzle under delivery action of the piston, an enclosure receiving the metering chamber and the dispensing chamber; the tubular nozzle has a transit channel with a lower end which is permanently closed by a transversal plug; at least one lower nozzle-ejection orifice opening laterally through said nozzle from said transit channel just above said transversal plug, the enclosure which receives the metering and dispensing chambers having a bottom with a guiding neck receiving the tubular nozzle which is mounted therein in a tight manner in such a way as to be slidable therein between a high position in which the ejection orifice is contained inside the guiding neck and is isolated from the exterior of the device, and the inlet orifice of the nozzle is situated in the dispensing chamber which receives the entire nozzle above the ejection orifice, and a low position in which most of the nozzle projects downwardly from the guiding neck with the inlet orifice situated in the dispensing chamber; and a gas bubble trap overlying the inlet orifice of the tubular nozzle, said gas bubble trap being fast with the tubular nozzle above the inlet orifice and defining a downwardly opening cavity about and immediately above said inlet orifice for interception and entrapment of bubbles for passage into said inlet orifice and discharge through said nozzle, said bubble trap having a smaller contour than the dispensing chamber in order to prevent any significant pumping effect in response to movement of the nozzle.

4,798,236

HIGH PERFORMANCE TIRE TREAD

Kenichi Fujiwara, Miki, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan

Filed Apr. 4, 1986, Ser. No. 848,280
Claims priority, application Japan, Apr. 12, 1985, 60-78885
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] B60C *11/03*
U.S. Cl. 152—209 R 4 Claims



1. In a heavy duty pneumatic radial tire comprising:
a pair of bead cores disposed in beads of the tire, respectively:
a carcass, extending across the beads, and having at least one carcass ply of rubberized metal cords of a radial or semi-radial construction, both edges of the carcass ply turned up around the bead cores from the axially inside to the outside of the bead core to form turned up portions axially outside the bead cores and a main portion therebetween;
a tread and a pair of sidewalls on the carcass;
a bead apex rubber stock, disposed between the main portion and the turned up portion the carcass ply, and extending radially outwardly from its base adjacent to each bead core;
a reinforcing layer of rubberized steel cords disposed axially outside said turned up portion of the carcass ply;
a protective layer of organic fiber cords disposed axially outside the reinforcing layer, said turned up portion and said apex rubber stock adjacent to the reinforcing layer;
a belt layer, including at least three plies of rubberized parallel metal cords, and disposed between the carcass and the tread, for providing stiff reinforcement beneath the tread, said parallel metal cords in each ply being arranged at a relatively small angle with respect to the circumferential direction of the tire so as to cross with one another,
the improvement comprising:
said tread having two main longitudinal grooves extending circumferentially in a zigzag or wavy line to divide the tread into two shoulder parts and a crown part therebetween; said crown part being centered on the equatorial plane of the tire and having width of about 30 to 65% of the tread width and further including at least one central row of blocks;
each tread shoulder part having a plurality of generally axially extending narrow cut grooves to form circumferentially separated blocks therein;
a volume index of the narrow grooves being in a range of 2.5 to 15; and

a circumferential stiffness index in each shoulder part being in a range of 30 to 70,

wherein the volume index and the circumferential stiffness index are defined as follows:

Volume Index={V/(SXd)}X100

V: total volume of the narrow grooves in the shoulder part

S: surface area of the shoulder part

d: depth of the main longitudinal groove

Circumferential Stiffness Index=(Kpt/Kpo)X100

Kpt: circumferential stiffness in the shoulder part after the narrow grooves are provided

Kpo: circumferential stiffness in the shoulder part before the narrow grooves are provided

Circumferential Stiffness=F/y

F: tangential force in the circumferential direction of the tire at the ground contacting surface of the shoulder part

y: variation of the ground contacting surface in the circumferential direction of the tire.

4,798,237

MOLDING DIE FOR USE IN CASTING

Akio Nakano, 14-1, Ichikawaminami 3-chome, Ichikawa-shi, Chiba-ken, Japan

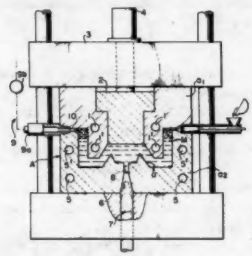
Filed Nov. 25, 1986, Ser. No. 934,657

Claims priority, application Japan, Nov. 30, 1985, 60-270480; Nov. 30, 1985, 60-270482

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] B22D *27/15*

U.S. Cl. 164—255 **4 Claims**



1. A molding die for use in casting, comprising:

a male die;

a female die associated with the male die so as to define an inner molding chamber therebetween;

at least one of said male and female dies being made of a ceramics material;

a pressuring insert associated with one of said male and female dies for applying pressure to a molten material in said molding chamber, said pressurizing insert formed of a ceramics material;

a heating mechanism disposed in both of said male and female dies;

a cooling mechanism disposed in both of said male and female dies;

a degasing plug movably assembled with the other of said male and female dies in opposing relation to said pressurizing insert and in fluid communication with said molding chamber, said degasing plug formed of a porous ceramics material; and

a depressurizing mechanism connected between said male and female dies and in fluid communication with said molding chamber to reduce gas pressure in said molding chamber.

4,798,238

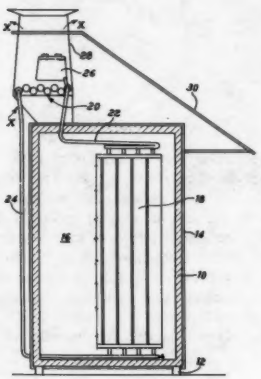
SHELTER FOR THERMALLY CONDITIONING ELECTRONIC APPLIANCES

Alberto Ghiraldi, Milan, Italy, assignor to D.S.D.P. - S.p.A, Milan, Italy

Filed May 27, 1981, Ser. No. 267,519

Int. Cl.[4] H01L *23/46*; F28D *15/00*

U.S. Cl. 165—32 **5 Claims**



1. A self-contained shelter providing a thermally conditioned environment in a well defined temperature range for an apparatus, said shelter comprising:

a closed box having a ceiling, a floor and thermoinsulating walls defining an internal environment for housing the apparatus;

at least one heat accumulator means for taking up heat within the internal environment, said heat accumulator means containing a heat transfer liquid in heat exchange relationship with the internal environment of the box;

at least one heat exchanger means for circulating the heat transfer liquid from the heat exchange relationship with the internal environment to a heat exchange relationship with an external environment outside of the box;

said heat exchanger means being located in a position higher than that of said heat accumulator means and connected thereto by a single closed heat transfer loop for allowing a thermosiphon circulation of the liquid contained in said accumulator means to the heat exchanger means only when the fluid temperature within said heat exchanger means is lower than that within said heat accumulator means;

said heat accumulator means extending vertically from the ceiling to the floor of the box so as to provide a water head as high as possible between said heat accumulator means and said heat exchanger means in order to enhance the circulation speed of said heat transfer liquid; and

said heat exchanger means is connected to an expansion tank.

4,798,239

DEVICE FOR THE PROTECTION AGAINST FREEZING OF INSTALLATIONS FOR THE STORAGE OR THE SUPPLY OF A FREEZING LIQUID, IN PARTICULAR WATER

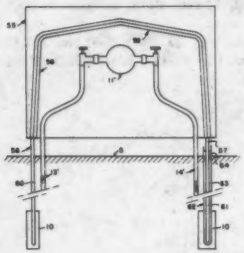
Paul H. Persohn, and Philippe Persohn, both of Le Rey, 33430 Bazas, France

Filed Jan. 6, 1984, Ser. No. 568,961

Claims priority, application France, Jan. 6, 1983, 83 00245; Aug. 26, 1983, 83 13744

Int. Cl.[4] F24J *3/08*; E03B *7/12*; F28D *15/00*

U.S. Cl. 165—45 **3 Claims**



1. A device for protection of a liquids installation susceptible to freezing comprising two heat pipes each having a lower part underground at a depth sufficient to insure a temperature always above 0° C., said lower part having a fin type heat recovery system and each said heat pipe having an internal system for distribution of condensate drip, and an upper part of each said heat pipe being located in the immediate vicinity of a part of a liquids installation exposed to a danger of freezing and joined to an inside face of a stationary cabinet of a thermal insulating material covering said liquids installation.

4,798,240

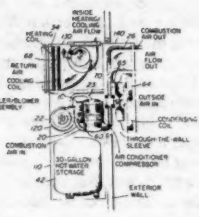
INTEGRATED SPACE HEATING, AIR CONDITIONING AND POTABLE WATER HEATING APPLIANCE

Joseph Gerstmann, Framingham; George M. Celorier, Jr., Milford, and Wayne S. Hill, Boston, all of Mass., assignors to Gas Research Institute, Chicago, Ill.

Filed Mar. 18, 1985, Ser. No. 712,863

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—48.1 **17 Claims**



12. An integrated water heating and space heating and cooling appliance comprising:

a housing having a lower water storage section, a middle burner section, and an upper internal air handling section in an internal portion, and having a side external air handling section extending from the internal portion to pass through a building wall;

an insulated hot water storage tank in the lower section of the housing;

a burner and burner heat exchanger in the middle section for heating a liquid heating medium;

a liquid to air heat exchanger in the upper section;

a heat transfer fluid circuit means for selectively directing heating medium from the burner heat exchanger in the middle section into heat exchange relationship with hot water in the hot water storage tank in the lower section to heat potable hot water or to the liquid to air heat exchanger in the upper section to heat hot air and for returning the heating medium to the burner heat exchanger;

an air conditioner evaporator in the upper section adjacent to and in face to face relationship with the liquid to air heat exchanger;

a blower in the upper section for blowing space conditioning air past the liquid to air heat exchanger and the evaporator for heating the air by the heat exchanger or cooling the air by the evaporator;

an air conditioner condenser in the side section;

a compressor operatively connected by conduit means to said compressor and evaporator to form a refrigeration system; and

a blower in the side section for blowing external air past the condenser.

4,798,241

MIXED HELIX TURBULATOR FOR HEAT EXCHANGERS

Frank N. Jarrett, and John E. Munch, Jr., both of Racine, Wis., assignors to Modine Manufacturing, Racine, Wis.

Filed Apr. 4, 1983, Ser. No. 482,018

Int. Cl.[4] F28F *13/12*

U.S. Cl. 165—109.1 **8 Claims**

1. A turbulator and conduit structure for use in heat exchangers comprising:

an elongated conduit formed of a good heat conductor such as copper, brass or aluminum through which a fluid to be subject to a heat exchange process is adapted to be passed and having inner and outer walls;

a first outer twisted wire winding having a predetermined pitch within said tube in substantial abutment with said inner wall; and

a second inner twisted wire winding having a predetermined pitch within said tube and at least partially within said first winding, said second winding having an open center;

the pitch of said first winding being substantially different than the pitch of said second winding.

4,798,242

HEAT EXCHANGER FOR RECOVERING HEAT FROM EXHAUST GASES

Masahiro Kito, Nagoya, Japan; Katsuhiro Mori, Hove, England, and Takashi Mitsumoto, Kassel, Fed. Rep. of Germany, assignors to Aisin Seiki Kabushiki Kaisha Co., Ltd., Kariya, Japan

Filed May 30, 1986, Ser. No. 868,530

Claims priority, application United Kingdom, May 30, 1985, 8513635

Int. Cl.[4] F27D *17/00*; F28F *19/00, 13/00*

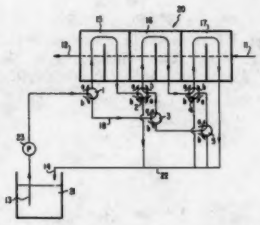
U.S. Cl. 165—103 **4 Claims**

1. A heat exchanger for recovering heat form exhaust gases, comprising:

a plurality of separately divided chambers for the exhaust gases;

a plurality of independently fluid passage means disposed within said chambers for the heat recovery fluid;

means for interconnecting and controlling said plurality of independent fluid passage means and which includes bypass means for bypassing each of said chambers and a plurality of valve means selectively operating said plural-



ity of independent fluid passage means and said bypass means; and

discharge means for independently discharging fluid from one or more of said plurality of chambers wherein at least one of said valve means is connected to each of said independent fluid passage means, said bypass means and said discharge means.

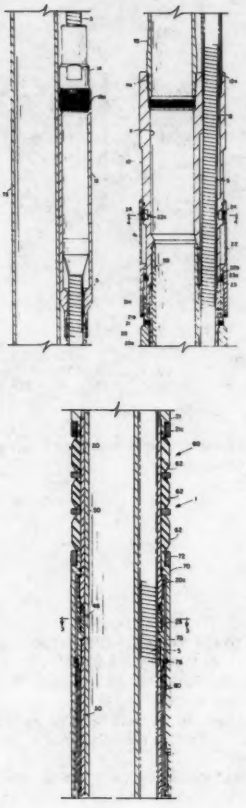
4,798,243

PACKER WITH ELECTRICAL CONDUIT BYPASS

Alfred R. Curington, The Woodlands, and Napoleon Arizmendi, Houston, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Nov. 12, 1987, Ser. No. 119,714
Int. Cl.[4] E21B *33/128, 33/129*
U.S. Cl. 166—65.1 **8 Claims**

1. A packer for a subterranean well conduit providing an electrical conduit bypass through the packer comprising, in combination: a top sub having a cylindrical exterior configuration and defining a plurality of eccentrically disposed longitudinal passages; one said passage having upper and lower ends and having means at its upper end for connection to a tubing string; another of said passages being designed to accommodate an electrical conduit; means for sealingly inserting said electrical conduit through said another of said passages; a tubular packer body assemblage; shearable means for securing the upper end of said tubular body assemblage to the bottom end of said top sub; annular packing means surrounding one part of said tubular body assemblage; an abutment ring secured to said tubular body assemblage adjacent one axial end of said annular packing means; said packing means being expandable into sealing engagement with the well conduit bore by axial compression thereof against said abutment ring; a plurality of peripherally spaced slip elements surrounding another part of said tubular body assemblage; axially shiftable upper and lower cone elements cooperable with said slip elements to expand same into engagement with the well conduit bore; a cylinder sleeve cooperable with said tubular body assemblage to define an annular fluid pressure chamber; an annular piston cooperating with said annular fluid pressure chamber; port means in said top sub and said tubular packer body assemblage for supplying pressured fluid from the tubing string to said annular fluid pressure chamber; means operatively connecting said cylinder sleeve and said annular piston to said packing means and said upper cone element to packoff the packer in the well conduit; a hollow mandrel secured to the bottom end of said one of said passages and extending downwardly through said tubular body assemblage; an upper cylindrical support ring mounted in the bore of said tubular packer body assemblage; said upper support ring having eccentric passages to receive said mandrel and the electrical conduit therein; a lower cylindrical support ring; means for securing said lower support ring to said mandrel adjacent to and concentric with said lower cone element; said support ring defining an eccentric passage to accommodate an extension of the electric conduit, whereby



only said top sub and said cylindrical support rings have to be revised to accommodate any selected sizes of said mandrel and the electrical conduit.

4,798,244

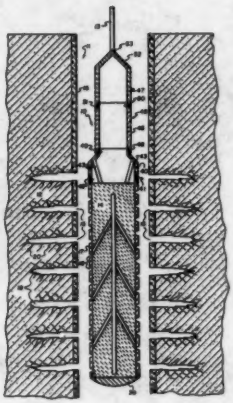
TOOL AND PROCESS FOR STIMULATING A SUBTERRANEAN FORMATION

Stephen A. Trost, 7120 S. Nut Tree, Salt Lake City, Utah 84121

Filed Jul. 16, 1987, Ser. No. 74,223
Int. Cl.[4] E21B *43/263*
U.S. Cl. 166—250 **35 Claims**

1. A tool for stimulating a subterranean formation comprising, an elongate propellant stack constructed from propellant material modules that are formed from a combination of propellant materials such that the propellant module combination will have a desired burn rate, propellant modules of a center portion to have identical convex and concave surfaces as the respective top and bottom faces thereof with end propellant modules to form the propellant stack ends each having an end face to fit within or over one of said center portion propellant modules convex or concave faces; adhesive means containing grains of a propellant or explosive mixed therein to provide a burn rate that is approximately that of the propellant stack for bonding said selected propellant modules together, said adhe-

sive means to burn with the propellant stack; means for supporting and lowering said propellant stack into a well bore to



a subterranean formation to be stimulated; and means for igniting said propellant stack.

4,798,245

METHOD OF TREATING HETEROGENEOUS FORMATION WITH POTASSIUM HYDROXIDE

Jeffrey E. Frank, Rockford, Ill., assignor to Marathon Oil Company, Findlay, Ohio

Filed Sep. 3, 1987, Ser. No. 94,194
Int. Cl.[4] E21B *43/12*
U.S. Cl. 166—281 **25 Claims**

1. A process of stabilizing clays in a water-sensitive, stratified subterranean sandstone formation containing migratable fine particles which interact with aqueous solutions having ionic makeup distinct from connate water to reduce permeability of the formation and flow of water therethrough, the formation being penetrated by a wellbore in fluid communication therewith and wherein the formation is composed of at least two different stratum having substantially different permeabilities and wherein an aqueous solution comprised of potassium hydroxide is contacted with the fine particles for a time sufficient to effectively render the fine particles relatively insensitive to the aqueous solution having an ionic makeup distinct from the connate water, the process comprising injecting sequentially:

(a) an aqueous presoak solution containing about 0.1 to about 20 wt % of potassium chloride in a volume amount sufficient to displace divalent cations away from the formation to be treated and to cause the clays surrounding the wellbore to assume a smaller volume, the potassium chloride is solubilized in water that may contain salts that are nondamaging to the process and are compatible with the fine particles,

(b) an effective amount of a solid potassium chloride into the formation to substantially reduce the permeability of the highly permeable stratum, the potassium chloride being dispersed in a carrier fluid substantially insoluble to the potassium chloride and containing less than 10 ppm of divalent cations, and

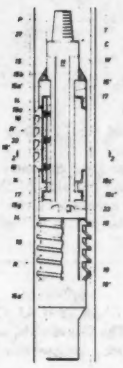
(c) injecting the aqueous potassium hydroxide solution into the lesser permeable stratum to effect treatment of the formation with the aqueous potassium hydroxide solution.

4,798,246

PIPE SCRAPER

David M. Best, P.O. Box 14273, Houston, Tex. 77221

Filed Apr. 22, 1987, Ser. No. 41,230
Int. Cl.[4] E21B *37/02*; B08B *9/02*
U.S. Cl. 166—311 **44 Claims**



1. A scraper for scraping the interior of pipe comprising scraping teeth on scraper blades, said scraping teeth having outer arcuate edges which form, prior to wear of said scraper teeth, a generally circular scraper assembly of an original outer diameter supported on a mandrel for radial expansion from said original outer diameter that is defined by a predetermined fully radially collapsed position of said circular scraper assembly adjacent said mandrel to an expanded position forming a second outer diameter radially outward relative to said original outer diameter and means to adjust and maintain said scraper blades radially outwardly relative to said mandrel so that as said arcuate scraper teeth wear, the scraper assembly maintains substantially said original outer diameter when said scraper blades are in said fully radially collapsed position and the scraper assembly also maintaining said second outer diameter when said scraper blades are in the expanded position until said scraping teeth are worn down substantially to said scraper blade.

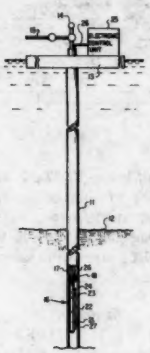
12. In a scraper for scraping the interior of pipe from substantially the drift diameter to at least maximum internal diameter of the pipe, wnerein the scraper includes scraper blade means with projecting scraper surface means thereon, the invention comprising: mandrel means including support means to support said scraper blade means for the same amount of radial movement of said blade means relative to said mandrel means from a first position defined by a substantially collapsed position adjacent the pipe drift diameter to second position defined by a substantially extended position to at least the pipe maximum internal diameter; and means to reposition the cutter blade means outwardly relative to said mandrel means as said scraper surface means wear to maintain the scraper surface means projecting from said mandrel means for scraping contact with cement, scale, burrs and the like from adjacent the pipe drift diameter to at least the pipe maximum internal diameter as the scraping surface means wear off to substantially their full extent.

4,798,247

SOLENOID OPERATED SAFETY VALVE AND SUBMERSIBLE PUMP SYSTEM

Thomas M. Deaton, Dallas, and Donald H. Perkins, Carrollton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jul. 15, 1987, Ser. No. 73,762
Int. Cl.[4] E21B *34/06*
U.S. Cl. 166—373 33 Claims



1. A submersible pump and solenoid operated safety valve system for use in a borehole, comprising:

a submersible pump driven by an electric motor positioned down in a borehole and connected to conduit means to produce a flow of well fluids within the borehole toward the surface;

a solenoid operated safety valve connected to interrupt the flow of well fluids toward the surface in response to the interruption of current to the solenoid holding said safety valve in an open condition;

a surface control unit;

a downhole control unit positioned down in the borehole and connected to said surface control unit and to the motor of said pump by means of an electrical cable;

means for supplying AC electrical power from said surface unit down the conductors of said cable; and

means mounted within said downhole control unit for providing electric current for operating said solenoid to open said safety valve.

27. A method for supplying power to a submersible pump and a solenoid operated safety valve in a petroleum production well completion within a borehole, comprising:

selectively supplying electric power with a surface control unit at a pair of different operating frequencies, the lower frequency power being capable of driving a motor for said pump and the higher frequency power being incapable of driving said motor for said pump;

actuating a solenoid in response to said higher frequency power with a downhole control unit to open said safety valve;

producing a signal in response to the open condition of said safety valve with a downhole control unit;

providing a cable interconnecting said surface control unit and said downhole control unit for conducting power at both frequencies downhole and conducting a signal uphole indicative of the open or closed condition of said safety valve; and

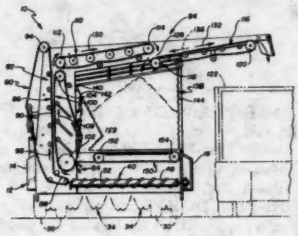
first connecting the higher frequency power to said cable with the surface control unit and then, in response to a valve open condition signal from the downhole control unit, connecting the lower frequency power to said cable with the surface control unit to drive the motor for said pump.

4,798,248

METHOD OF HARVESTING BEETS

Wayne J. Schwitters, Clara City, Minn., assignor to WIC, Inc., Shelly, Minn.

Division of Ser. No. 773,118, Sep. 6, 1985, Pat. No. 4,699,218.
This application Aug. 24, 1987, Ser. No. 88,243
Int. Cl.[4] A01D *25/04, 61/00*
U.S. Cl. 171—1 18 Claims



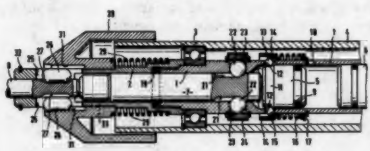
1. A method of harvesting sugar or red beets comprising the steps of traversing a field of row-planted beets in one direction, removing the beets from certain of the rows in said field while traveling in said one direction, directing the removed beets to one side of the harvester, elevating the beets at said one side of the harvester to a predetermined height, shifting the elevated beets at generally said predetermined height to a location intermediate said one side and the opposite side of said harvester and shifting at least some of said elevated beets from said intermediate location to said opposite side for discharge into a transport vehicle adjacent said opposite side.

4,798,249

LOCKABLE STRIKING MECHANISM FOR HAMMER DRILL

Hans-Jürgen Hoereth, Langenbach, and Anton Neumaier, Fürstenfeldbruck, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft

Filed Oct. 5, 1987, Ser. No. 105,084
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633675
Int. Cl.[4] B25D *17/06*
U.S. Cl. 173—14 4 Claims



1. Hammer drill with a striking mechanism having a striking direction and a front end arranged to hold a tool, comprising a guide cylinder having an axis extending in the striking direction, said striking mechanism located within said guide cylinder for delivering percussive force in the striking direction to the tool, said striking mechanism includes a free piston slidably displaceable in a reciprocating manner within said guide cylinder in the striking direction, means for securing said free piston in a locked position so that said free piston is unable to perform reciprocating movements within said guide cylinder, said free piston having an axially extending outer surface, a recess formed in said outer surface, balls mounted in said guide cylinder, said securing means comprises spring means for biasing said balls inwardly into the recess for securing said free piston in the locked position, wherein the improvement comprises that said guide cylinder has openings therethrough with said

balls each mounted in one of said openings, and said spring means comprises a ring encircling said guide cylinder and disposed in contact with said balls, and a spring in contact with said ring for pressing said ring against said balls and biasing said balls radially inwardly.

4,798,250

BALANCE WITH WIND GUARD

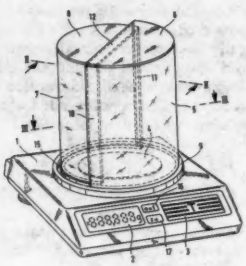
Erich Knothe, Eddigehausen; Franz-Josef Melcher, Hardegsen; Günther Maaz, Uslar; Klaus Dardat, Dransfeld, and Walter Södler, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,187

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642842

Int. Cl.[4] G01G *23/18, 21/28*

U.S. Cl. 177—181 8 Claims



1. Balance with a wind guard which comprises at least two cylindrically curves wall elements which can be shifted towards each other for opening and closing, the improvement wherein each wall element is connected to a corresponding top segment of a circular covering surface to allow loading from above when said wall elements are opened.

4,798,251

ELECTRONIC BALANCE WITH SCALE ON TOP AND CORNER-LOAD ADJUSTMENT

Günther Maaz, Uslar; Eduard Bierich, Hann-Münden, and Eberhard Stadler, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

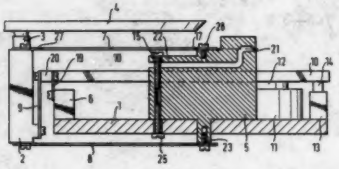
Filed Apr. 1, 1988, Ser. No. 176,630

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710997

Int. Cl.[4] G01G *3/08, 23/14*

U.S. Cl. 177—229 6 Claims

1. In an electronic balance with a scale on top, a balance scale (4), a balance scale carrier (2), two identical guide rods (7,8) which connect in an articulated manner the balance scale carrier and the balance scale in the form of a parallel guide to a system carrier (1/5) fixed to the housing and with at least one corner-load adjustment lever (22,22',22'') which is connected to the system carrier via thin area (21,24,30/31) and which carries a support point in the vicinity of this thin area for the end of a guide rod on the system carrier, comprising that the



corner-load adjustment lever (22,22',22'',22''') is bent at right angles between the support point of the guide rod (7) and the thin area (21,24,30/31) to the system carrier (1/5) in such a manner that the moving joint (16,17) of the guide rod (7) and the thin area (21,24,30/31) are at the same height.

4,798,252

DRYING BALANCE WITH TEMPERATURE CONTROL

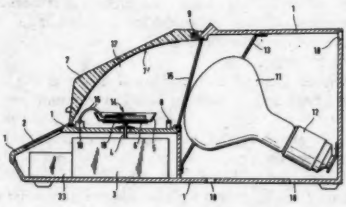
Erich Knothe, Eddigehausen; Günther Maaz, Uslar, and Volker Handwerk, Bovenden, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Feb. 12, 1988, Ser. No. 155,600

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706609

Int. Cl.[4] G01G *19/00, 21/28;* G01N *25/56*

U.S. Cl. 177—245 8 Claims



1. Drying balance scale with a radiation source for heating and drying a substance distributed on a balance scale, with a temperature sensor for monitoring and controlling the output of the radiation source and with electronic evaluating circuitry for evaluating the measured sensed temperature values of the balance scale and for controlling the radiation source, characterized in that a temperature gauging disk with another temperature sensor built in is connected to the drying balance scale.

4,798,253

ELECTRIC POWER STEERING APPARATUS

Hiroshi Naito, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 21, 1987, Ser. No. 77,187

Claims priority, application Japan, Jul. 22, 1986, 61-172091

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—79.1 7 Claims

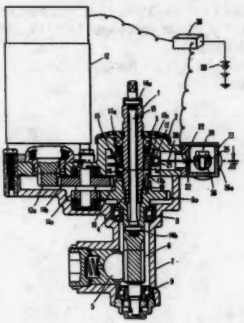
1. An electric power steering apparatus comprising:

an axial conversion means for converting the relative rotation between an input shaft and an output shaft to an axial deviation;

the axial conversion means including an axially moveable slider element;

a first sensing means for sensing the axial deviation of the slider and including a lever with torque sensing means, the lever being fixed at one end to a housing and supported at the other end by the slider;

a second sensing means for sensing the direction and torque of rotation of a steering wheel;



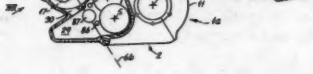
a controller means for obtaining a comparison value by comparing output signals from the first and second sensing means and controlling the direction and torque of rotation of an electric motor which contributes to the steering force and for stopping the motor when the comparison value is outside a predetermined range.

4,798,254

COMPONENTS IN OR FOR SELF-POWERED VEHICLES

Geoffrey P. Lings, Bourne, England, assignor to National Research Development Corporation, London, England

Filed Mar. 10, 1987, Ser. No. 24,080
Int. Cl.[4] B60K 5/04
U.S. Cl. 180—58 14 Claims



1. In or for a self-powered vehicle, a power unit comprising:

a casing structure for said power unit;

a reciprocating piston internal combustion engine comprising a plurality of pistons working in a plurality of cylinders disposed in line, whereby the axes of said cylinders are parallel and lie in a common first plane, a crankcase, and a crankshaft rotatable within said crankcase about an axis and driven by said pistons;

a transmission system comprising a plurality of gearcarrying shafts including an input shaft, and two coaxial output shafts adapted respectively to drive two wheels located to opposite sides of said power unit, said axes of said output shafts being substantially parallel to said crankshaft axis, and said input shaft being in driving communication with said crankshaft;

a second plane lying at right angles to said common first plane and including said crankshaft axis, said transmission system being arranged alongside said cylinders and so that said input shaft, said output shafts and said cylinders all lie to the same side of the said second plane;

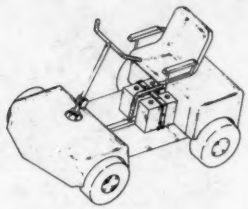
said casing structure including a casing part within which said cylinders are located, in which a first plane joint face is presented by said casing part and is substantially co-planar with said axis of said output shafts, and including a cylinder head adapted to engage with said first plane joint face.

4,798,255

FOUR-WHEELED T-HANDLEBAR INVALID CARRIAGE

Donald P. H. Wu, No. 169, Kan Tzu Ku, Shang Kan Tsun, Hsin Feng Hsiang, Hsinchu County, Taiwan

Filed Oct. 29, 1987, Ser. No. 113,983
Int. Cl.[4] B62B 9/00
U.S. Cl. 180—65.1 2 Claims



1. An invalid carriage comprising:

a rigid seat support frame for supporting a seat for rotation about a substantially vertical axis;

a seat, rotatable about a substantially vertical axis, supported on said seat support frame;

locking means for releasably locking said seat supported on said seat support frame in a predetermined rotational position;

a laterally extending rotatable rear axle journally supported on said seat support frame for rotation about a substantially horizontal lateral axis, said rotatable rear axle having a first end and a second end;

a pair of rear wheels, each of said rear wheels fixed to a respective end of said rotatable rear axle for rotation therewith;

power supply means mounted on said seat support frame for providing motive power for rotation of said rear axle about said substantially horizontal lateral axis;

transmission means, interconnecting said power supply means and said rotatable rear axle, for rotating said rear axle about said substantially horizontal lateral axis upon provision of motive power from said power supply means;

a laterally extending rod pivotally mounted on said seat support frame for pivotal movement about a substantially horizontal longitudinal axis, said laterally extending rod having a first end and a second end, said laterally extending rod being spaced longitudinally forwardly of said rear axle;

a pair of front wheels, each rotatable about a substantially horizontal axis;

mounting means for fixing said pair of front wheels to respective ends of said laterally extending rod for rotation about said substantially horizontal axis, said mounting means being pivotally connected to said laterally extending rod for pivotal movement about a substantially vertical axis;

steering means, for causing pivotal movement of said mounting means about said substantially vertical axis said steering means including a T-handlebar mounted on said seat supports frame by a sleeve member;.

front wheel oscillation restriction means, mounted on said sleeve member, for yieldably resisting pivotal movement

of said laterally extending rod about said substantially horizontal longitudinal axis beyond a predetermined extent.

4,798,256

HYDROSTATIC AUXILIARY STEERING DEVICE

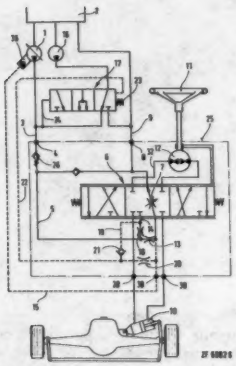
Rolf Fassbender, Mutlangen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 23, 1987, Ser. No. 111,820

Claims priority, application European Pat. Off., Nov. 11, 1986, PCT/EP86/00647

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—133 **3 Claims**



1. In a hydrostatic auxiliary steering system for a motor vehicle having a steering wheel (11) and steerable wheels, a metering unit (12) driven by said steering wheel (11), control valve means (6) connected to the steering wheel for displacement from a neutral position in two manipulation directions when the steering wheel is turned, a first high pressure pump (1) having a flow control device (36), a steering servo motor (10) connected to the vehicle steerable wheels and having opposing pressure chambers, a reservoir (12), a return line (9) connecting said reservoir to the control valve means, a pressure line (3, 4, 14) interconnecting said control valve means with said first high pressure pump, said control valve means in the neutral position conducting flow to the metering unit (12) while blocking flow to the servo motor and responsive to displacement thereof from the neutral position for opening a flow path to the metering unit (12) while conducting flow to one of the pressure chambers of the servo motor (10) as the other of the pressure chambers is connected by the return line (9) to the reservoir (2), a first metering orifice (13) conducting flow from the first high pressure pump (1) to the metering unit (12), a first control line (15) connecting the first metering orifice (13) downstream of the first high pressure pump to said flow control device (36) controlling the flow from the first high pressure pump (1) to the control valve means (6), and a second high pressure pump (16) connected to the control valve means (6) in parallel with the first high pressure pump (1), the improvement residing in a second metering orifice (18) located in the pressure line (3, 4, 14) between the first high pressure pump (1) and the metering unit (12), a connecting line (19) interconnecting the first and second metering orifices (13, 18) downstream of the first high pressure pump, a third metering orifice (20) connected to the first metering orifice (13) downstream thereof, a check valve (21) in the connecting line (19) downstream of the second metering orifice (18) conducting pressure medium in one direction therefrom, a second control line (22) connected to the connecting line (19) between the third metering orifice (20) and the check valve (21) and flow dividing valve means (17) connected to said second control line (22) for controlling flow from the second high pressure pump (16) to the metering unit (12).

4,798,257

ENERGY RECOVERY APPARATUS FOR TURBO COMPOUND ENGINE

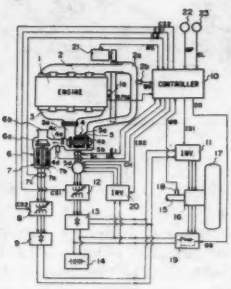
Hideo Kawamura, Samukawa, and Katsuyuki Tamai, Yokohama, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 17, 1986, Ser. No. 920,133

Claims priority, application Japan, Oct. 19, 1985, 60-233937; Oct. 19, 1985, 60-233939

Int. Cl.[4] B60K *13/00*

U.S. Cl. 180—165 **6 Claims**



1. An energy recovery apparatus in a turbo compound engine having a turbocharger operable by exhaust gases emitted from an internal combustion engine mounted on a vehicle, said energy recovery apparatus comprising:

(a) a first rotary machine disposed in said turbocharger;

(b) a second rotary machine disposed on a wheel axle driven by said engine;

(c) a third rotary machine disposed in an exhaust turbine disposed in an exhaust pipe of said internal combustion engine, and operable as a generator for converting exhaust energy from the internal combustion engine to electric energy for energy recovery;

(d) means for detecting the speed of rotation of said engine;

(e) means for detecting the load on said engine;

(f) means for operating said first rotary machine as a generator while said engine is idling; and

(g) means for charging a battery with electric power generated by said first rotary machine.

4,798,258

THROTTLE CONTROL ASSEMBLY FOR A VEHICLE SPEED CONTROL UNIT

Jack O. Otteson, Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio

Division of Ser. No. 712,542, Mar. 15, 1985, Pat. No. 4,637,485, which is a continuation-in-part of Ser. No. 603,494, Apr. 24, 1984, abandoned. This application Dec. 30, 1986, Ser. No. 947,724

Int. Cl.[4] B60K *31/06*

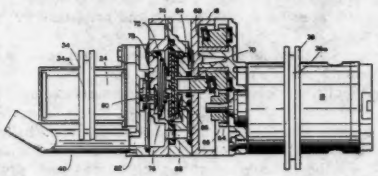
U.S. Cl. 180—175 **14 Claims**

1. In a speed control unit for controlling the actual speed of a vehicle at a desired speed, the vehicle including an engine having a throttle movable in two directions respectively to increase and decrease the speed of the vehicle and the speed control unit including means for generating a signal representing the desired speed of the vehicle, means for generating a signal representing the actual speed of the vehicle, and means responsive to said desired speed signal and said actual speed signal for generating a control signal when the actual speed of

the vehicle is less than the desired speed, a throttle control assembly installable as a unit in an engine compartment of said vehicle and comprising:

an electric motor; and

a vacuum pump operatively connected to said motor to generate a vacuum when said motor is energized so as to move said throttle and increase the actual speed of the vehicle to said desired speed, said vacuum pump including a pump chamber, a rotatably mounted swash plate, a reciprocably mounted plunger including a rod portion having one end in engagement with the swash plate and an enlarged head portion disposed at the other end of the rod



portion and within the pump chamber, a flexible pumping diaphragm in the pump chamber operatively associated with the plunger head portion, a spring in the pump chamber biasing said diaphragm and plunger toward said swash plate, a vacuum chamber, a first pair of one-way valves associated with the pump chamber on one side of said diaphragm, and a second pair of one-way valves associated with the pump chamber on the other side of said diaphragm, one valve of each pair permitting one-way flow of air from the pump chamber to atmosphere, and the other valve of each pair permitting one-way flow of air from the vacuum chamber to the pump chamber.

4,798,259

FRONT WHEEL SPEED-UP MECHANISM FOR A FOUR WHEEL DRIVE VEHICLE WHEN TURNING

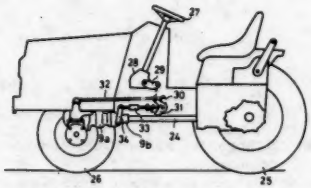
Toshiro Azuma, Minoo, and Toshiyuki Hacegawa, Ashiya, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Amagasaki, Japan

Filed Dec. 11, 1987, Ser. No. 132,061

Claims priority, application Japan, Jun. 25, 1987, 62-159107

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—233 **7 Claims**



1. A front wheel speed-up mechanism for a four wheel drive vehicle when turning comprising:

a speed-up bevel gear shaft provided perpendicularly to the utmost end of a front wheel driving shaft,

speed-up bevel gear freely sleeved onto both axial ends of said bevel gear shaft,

said speed-up bevel gears engage with a front wheel pinion bevel gear provided at the rear end of a front wheel pinion shaft, and a braking bevel gear freely sleeved onto the outer periphery of said front wheel driving shaft,

a braking bevel gear boss at said braking bevel gear freely sleeved onto the outer periphery of said front wheel driving shaft,

friction plates interposed between said braking gear boss and an actuator supported within a bearing case and being rotatable at a fixed angle to said bearing case and slidable axially of said front wheel driving shaft,

said friction plates abut at one end against a pressure receiving surface formed in said bearing case,

whereby said friction plates can be urged at their other end by a speed-up shifter toward an urging member fixed to said actuator,

said speed-up shifter, when said vehicle travels straight forward, retains said braking bevel gear boss integrally with said front wheel driving shaft, and slides in association with turning of a steering handle of said vehicle in the direction of releasing retainment between both said braking bevel gear boss and said front wheel driving shaft, thereby releasing said friction plates after said shifter moves in the releasing direction away from said urging member, and

said actuator rotates by friction caused by said friction plates and balls which are disposed in cam grooves constituted between said bearing case and said actuator so as to slide said urging member in the direction of urging said friction plates toward said pressure receiving surface.

4,798,260

STEERING APPARATUS FOR A FRONT WHEEL DRIVE TRACTOR

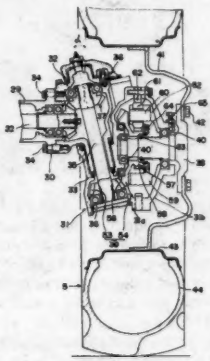
Masaru Nakata, Sakai, and Yuichi Kitao, Ashiya, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Nov. 7, 1986, Ser. No. 928,124

Claims priority, application Japan, Mar. 27, 1986, 61-70301; Apr. 4, 1986, 61-78970

Int. Cl.[4] B60K *17/30*

U.S. Cl. 180—253 **11 Claims**



1. A steering apparatus for a front wheel drive tractor comprising, at each of opposite lateral sides thereof,

a first front axle,

a front axle case housing said first front axle and defining an upper boundary of a free space in a lower position of the tractor,

a kingpin,

a transmission case provided in an outer end region of said front axle case to accommodate said kingpin, said transmission case including a stationary case connected to said front axle case, and a rotatable case connected to said stationary case to be pivotable about said kingpin, said rotatable case defining a lateral boundary of said free space,

a second front axle attached to said movable case and includ-

ing means for attaching a rim of a front wheel to said second front axle, said means for attaching said rim to said second front axle lies in a plane along an outer surface of said front wheel, and substantially the length of said kingpin is confined within an inner boundary of said front wheel with a lower end of said kingpin between a center line of said front wheel and an inner boundary of said front wheel,

a first transmission operatively connecting said kingpin to said first front axle, and

a second transmission operatively connecting said second front axle to said kingpin,

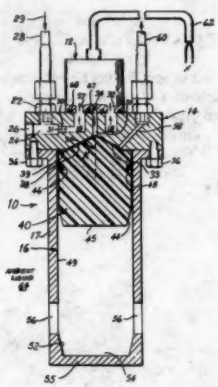
wherein said front wheel has a substantially zero camber angle, and said kingpin is inclined such that said movable case is substantially entirely disposed inside an inner boundary of said rim of said front wheel.

4,798,261

SMALL POWERFUL HYDRO GUN

Paul Chelminski, Norwalk, Conn., assignor to Bolt Technology Corporation, Norwalk, Conn.

Filed Jul. 3, 1986, Ser. No. 881,911
Int. Cl.[4] G01V 1/38
U.S. Cl. 181—120 **14 Claims**



1. An impulse generating hydro gun for generating an acoustical energy impulse in liquid having a steeply rising pressure followed by an abrupt pressure drop comprising:

a cylinder wall having first and second ends with discharge port means in said cylinder wall near the second end for admitting liquid into a cylinder within said cylinder wall when said hydro gun is submerged in liquid and for discharging liquid from said cylinder through said discharge port means when said hydro gun is fired,

a piston mounted for free movement in said cylinder,

said piston initially being positioned within said cylinder near said first end of said cylinder wall,

the region within said cylinder near said first end of said cylinder wall being the head end of the cylinder,

a solenoid valve for firing said hydro gun and having at least one inlet port and an outlet port,

chamber block means secured to said first end of said cylinder wall and being positioned between the head end of said cylinder and said solenoid valve,

said chamber block means having an annular firing chamber therein communicating with said inlet port of said solenoid valve,

said chamber block means having a discharge passage in communication between said outlet port of said solenoid valve and said head end of said cylinder,

means for charging said annular firing chamber with pressurized gas,

means for actuating said solenoid valve for abruptly releasing said pressurized gas from said firing chamber through said discharge passage into the head end of the cylinder for propelling said piston along said cylinder toward the second end of said cylinder wall for thereby discharging liquid from the cylinder through said discharge port means,

said piston effectively blocking said discharge port means when said piston nears said second end of the cylinder wall for suddenly interrupting the discharge of liquid through said discharge port means for creating at least one cavity in the surrounding liquid which collapses by hydrostatic pressure for generating said acoustical impulse in liquid,

means for slowing and stopping said piston as it nears said second end of the cylinder wall, and

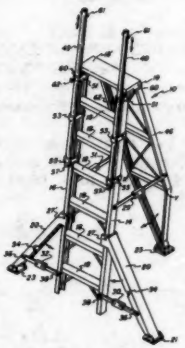
said hydro gun having vent means communicating with the head end of the cylinder for connection to a vent line extending to the atmosphere above the liquid surface for venting to the atmosphere the expanded pressurized gas from the cylinder after said piston has been propelled toward the second end of said cylinder wall for enabling the hydrostatic pressure of liquid entering into the cylinder through said discharge port means to return said piston to the initial position at the head end of the cylinder near said chamber block means.

4,798,262

TRIPODAL SUPPORT

Paul Margolies, 1350 Spanish River Rd., Boca Raton, Fla. 33432

Filed Sep. 12, 1986, Ser. No. 906,719
Int. Cl.[4] E06C 1/14, 1/383, 7/18
U.S. Cl. 182—106 **7 Claims**



1. A tripodal support ladder for stable placement on a support surface comprised of:

a pair of spaced apart parallel side rails having at least two horizontally disposed ladder rungs connected therebetween including an upper rung;

a rear support member hingedly connected at its upper end to said upper rung and providing at its lower end a first ground engaging support point means;

said rear support member being moveable between an open position and a closed position and being maintained rigidly in said open position by collapsible strap means pivotably connected between at least one of said side rails and said rear support member;

a pair of extendable and retractable lateral support leg member means hingedly connected one to each of said side rails, said support leg member means hinged near their

upper end portions to said side rails and each having a single ground engagement support point means at their lowermosts ends which comprise second and third ground engaging support point means;

each of said lateral support leg member means being rigidly maintainable in a fixed in-use position by way of collapsible strap means pivotably connected between said lateral support leg member means and said side rails;

said lateral support leg member means movable between a fully extended and a fully retracted position, said lateral support leg member means being constrained to swinging motion in a single plane;

said first, second and third ground engaging support point means providing the only ground engagement points of the tripodal support each contacting said support surface at a point equidistant from the other two when said lateral support leg member means are in the fully extended position.

4,798,263

LADDER STABILIZER

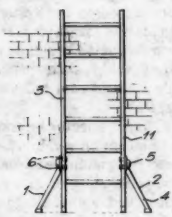
David H. C. Harvey, Poynings, and Ian G. Menelaus, Burgess Hill, both of Great Britain, assignors to Stabilad Limited, Burgess Hill, England

Filed May 21, 1987, Ser. No. 52,789

Claims priority, application United Kingdom, Oct. 2, 1986, 8623702

Int. Cl.⁴ E06C 5/36, 7/42

U.S. Cl. 182—107 **13 Claims**



1. A stabiliser device for attachment to a stile of a ladder, said stabiliser device comprising an attachment portion adapted to be removably coupled to a stile of a ladder and a leg portion connected to and extending outwardly from the attachment portion to a surface engaging end, the attachment portion being provided with two pins extending outwardly therefrom, said pins each having an axis, said pin axes being generally parallel to one another, said pins being received in holes in said attachment portion so as to be axially moveable, said pins being positioned such that the stile can pass freely therebetween when the axis of the stile, the axes of the pins, and a line joining pin axes are generally mutually perpendicular, said pins being spaced such that they engage the respective edge faces of the stile when the stabiliser device is rotated about an axis generally parallel to the axes of the rungs of the ladder, said device further comprising means for clamping said pins into the desired axial position.

4,798,264

KNEELING AID

Jack V. Miller, and Ruth Ellen Miller, both of 700 N. Auburn Ave., Sierra Madre, Calif. 91024

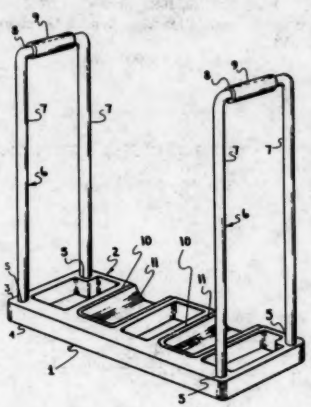
Filed Dec. 28, 1987, Ser. No. 138,651

Int. Cl.⁴ A47C 9/00, 13/00

U.S. Cl. 182—230 **9 Claims**

1. A kneeling aid to facilitate kneeling including:

a generally planar and generally rectangular, elongated horizontal platform having a lower surface and an upper surface, the upper surface being provided with a recessed socket at each corner of each end of the platform, said recessed sockets in the upper surface terminating at, and bonded to the lower surface of the platform;



an inverted U-shaped strut at each end of the platform and having a pair of depending legs engaged into the respective recessed sockets at each end of the rectangle; and

a cushion means on the upper surface of the platform.

4,798,265

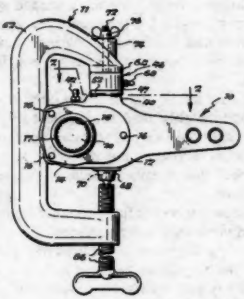
SLACK ADJUSTER LUBRICATOR AND METHODS OF USE

Daniel F. Gibas, Niagara Falls, N.Y., assignor to Ivan's Idiosyncrasy, Inc., Niagara Falls, N.Y.

Filed Nov. 5, 1987, Ser. No. 117,474

Int. Cl.⁴ F16N 3/00

U.S. Cl. 184—105.1 **9 Claims**



1. A method of lubricating the interior and exterior surfaces of a locking collar mechanism of a vehicular slack adjuster, which comprises the steps of encasing the locking collar mechanism with a pressurizable lubrication chamber, sealing the lubrication chamber with a surface of the slack adjuster surrounding the locking collar mechanism without being in sealing engagement with said locking collar mechanism when said locking collar is elevated, and charging said chamber with lubricant under sufficient pressure to deliver lubricant to said interior and interior surfaces of the locking collar mechanism.

4,798,266

HYDRAULIC HOIST PLATFORM

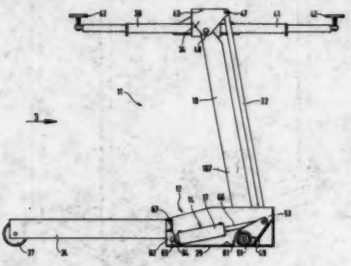
Gerhard Finkbeiner, Kasernenstrasse 6, 7290 Freudenstadt, Fed. Rep. of Germany

Filed Feb. 20, 1987, Ser. No. 17,766

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605650

Int. Cl.[4] B66F 7/08

U.S. Cl. 187—8.71 16 Claims



1. Hydraulic hoist platform for vehicles in the size range of passenger motor vehicles, such as passenger cars, passenger car trailers and the like, comprising:

a floor group that is stationary when in use and supports static and dynamic loads on a floor,

said floor group comprising two floor group halves that are spaced from one another by a distance greater than the width of a passenger motor vehicle,

each of said floor group halves have two spaced-apart side members,

a parallelogram device for each of said floor group halves, each of said parallelogram devices being movable up and down parallel to one another in a vertical plane, each comprosing a carrier arm and a guide rod having a first end region with first and second horizontal bearings at which said carrier arm and said guide rod are articulated to their respective floor group halves, said first horizontal bearing being spaced a smaller distance from the floor than said second horizontal bearing,

said parallelogram devices having a second end region having a support device for the passenger vehicle,

said first horizontal bearing is a bearing of said carrier arm and said second horizontal bearing is a bearing of said guide rod,

each of said first horizontal bearings comprises a horizontal bearing body highly loadable at least by torsion, which has two rotational bearing surfaces spaced from one another in axial direction and rotatably supported by said spaced apart side members each of the respective floor group halves,

each of said bearing bodies have an inner region and an outer region between its bearing surfaces,

each of said carrier arms is secured rigidly to said inner region of the respective bearing body,

a lever device is secured rigidly to said outer region of each of said bearing bodies,

said lever device is angularly offset from said carrier arm in the direction of lifting in relation to the direction of said carrier arm,

a hydraulic unit for each of said floor group halves, each of said hydraulic units having a hydraulic cylinder having a first horizontal bearing half and a piston rod having an end having a second horizontal bearing half that is parallel to said first horizontal bearing half,

each of said hydraulic units is arranged substantially horizontally in each of said floor groups, and

one of said bearing halves of said hydraulic unit is provided on said lever device and the other of said bearing halves of said hydraulic unit is provided on said floor group.

4,798,267

ELEVATOR SYSTEM HAVING AN IMPROVED SELECTOR

Michael M. Foster, and Kermit L. Racely, both of Memphis, Tenn., assignors to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Jan. 20, 1987, Ser. No. 5,554

Int. Cl.[4] B66B 1/34

U.S. Cl. 187—28 19 Claims

1. In an elevator system including a car vertically displaceable between landings, a selector comprising:

a metal tape vertically supported relative to said landings, said tape including longitudinal edges and a plurality of holes spaced from said edges and vertically aligned, a first set of strip magnets for identifying each landing, and a second set of strip magnets for indicating door zone position at each landing, said first and second sets of magnets lying on opposite sides of said holes inwardly from the respective edges; and

a selector unit including a selector housing mounted on the elevator car, guide means on said housing for engaging the edges of said tape for guiding said tape for maintaining precise horizontal positioning relative to the selector unit, a first bar magnet, and a first magnetic sensor means, means for mounting said bar magnet and first sensor means on opposite sides of said tape, in opposed relation to one another and in registry with said holes, second magnetic sensor means mounted on said housing in vertical alignment with said first set of strip magnets, and third magnetic sensor means mounted on said housing in vertical alignment with said second set of strip magnets, wherein said first sensor means produces a signal when aligned with any of the holes, and wherein said holes are elongated in the lateral direction for producing a sharp, strong magnetic signal in said first sensor means compared to holes of round configuration.

4,798,268

MULTIPLE DISC BRAKE

Eric Fargier, Neuilly-Plaisance, and Jean-Claude Mery, Pavillons-sous-Bois, both of France, assignors to Bendix France, Drancy, France

Filed Oct. 21, 1987, Ser. No. 111,942

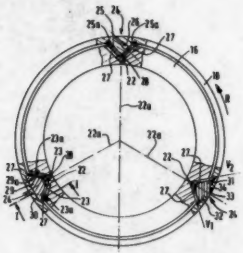
Claims priority, application France, Oct. 29, 1986, 86 15044

Int. Cl.[4] F16D 55/36

U.S. Cl. 188—71.5 4 Claims

1. A multiple disc brake, comprising a first rotary disc fixed to a hub connected to a rotating member to be braked and a second rotary disc capable of sliding axially relative to the hub and to the first rotary disc while at the same time being integral in terms of rotation with the first disc, the axes of the hub and discs coinciding with one another, and a set of friction blocks having friction linings capable of being laid against faces of the discs by means of an actuating device, characterized in that a first axial guide sleeve fixed to the first rotary disc is arranged

coaxially relative to a second axial guide sleeve fixed to the second rotary disc and is connect to the second axial guide sleeve by means of several axial guide tracks which are uniformly distributed angularly over the sleeves, the guide tracks having matching rolling surfaces between which rolling members are interposed, the rolling members comprising cylindrical bearings of small diameter arranged transversely relative to a sliding axis of the second axial guide sleeve, the guide tracks being of a groove-and-projection type wherein faces of each groove disposed in one of the sleeves interact, for transmitting braking torque to the second rotary disc, with opposite faces of a corresponding projecting axial rib on the other sleeve in



order to form V-shaped sets of rolling surfaces, branches of the respective V-shaped sets of rolling surfaces having different inclinations relative to a radial plane extending substantially midway through the guide tracks, a branch of lesser inclination and nearest a radius of the coaxial sleeves being the branch which makes torque-transmitting contact during braking in one direction of disc rotation, the grooves disposed in an outer surface of the radially inner sleeve and the axial ribs on an inner surface of the radially outer sleeve, and the V-shaped sets of rolling surfaces having at least one of the associated grooves and axial ribs comprising surfaces of high hardness and abrasion resistance.

4,798,269

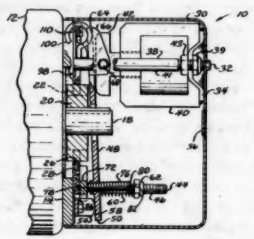
DIRECT LEVER ACTING SOLENOID RELEASED BRAKE MECHANISM

Bernard J. Lindner, Waukesha, and Harold Lorenz, Greenfield, both of Wis., assignors to PT Components, Inc., Indianapolis, Ind.

Filed Aug. 6, 1986, Ser. No. 893,694

Int. Cl.[4] B60T *13/04*; F16D *11/06*; H02K *7/10*; H02P *3/00*

U.S. Cl. 188—171 **30 Claims**



1. An improved brake mechanism for selective stopping and permitting rotation of a shaft journaled in a motor frame comprising

friction disc means secured to said shaft for rotation therewith

end plate means secured to the motor frame and having a disc engaging surface,

non-rotatable brake shoe means mounted for movement toward and away from said disc means,

bearing plate means disposed radially outwardly from said brake shoe means between outer ends thereof and secured to said end plate means on an outermost circumferential surface thereof,

support lever means having one end pivotally abutting against said bearing plate means,

compression spring means disposed adjacent said one end of said support lever means for urging said lever means against said bearing plate means, said compression spring means being adaptable to be interchanged with compression spring means having different torque ratings,

adjustment means disposed adjacent said one end of said support lever means having an inner end urging said brake shoe means against said friction disc means,

solenoid means directly secured to said end plate means on an outermost circumferential surface thereof diametrically opposite from said bearing plate means, said solenoid means being adaptable to be interchanged with solenoid means having different torque ratings, and

reciprocally movable plunger means of said solenoid means pivotally connected to said support lever means at its other end, said plunger means being adaptable to return to a deenergized position without the aid of gravity so that said end plate means may be mounted on the motor frame in any preselected position of circular angulation thereabout

whereby energization of said solenoid means is effective to permit rotation of said shaft and deenergization of said solenoid means is effective to stop rotation of said shaft.

4,798,270

HYDRAULICALLY ACTUATED SLIDING-CALIPER DISC BRAKE

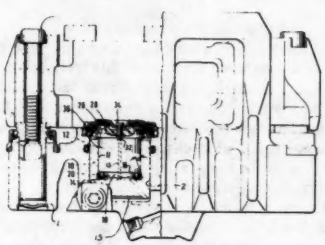
Wilhelm Schneider, Steinsburgweg, and Roland Keller, Leimen, both of Fed. Rep. of Germany, assignors to Deutsche Perrot-Bremse GmbH, Mannheim, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,191

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641181

Int. Cl.[4] F16D *65/847*

U.S. Cl. 188—264 G **15 Claims**



1. An actuator for a hydraulically actuated caliper disc brake having a housing, a brake shoe, a cylinder in the housing, and an actuator mounted in the cylinder and operated by hydraulic fluid pressure for engagement with and operation of the brake shoe comprising:

a cup-shaped actuating piston slidably mounted in the housing cylinder for displacement toward the brake shoe by the hydraulic fluid;

an internal cylindrical wall and base in said piston forming a hollow interior in said piston;

a cylindrical core of heat insulating material slidably mounted in said hollow interior and having an outer end

face adjacent to the brake shoe, an inner end face adjacent said base and a peripheral surface;

a longitudinal bore extending completely through said core;

means for releasably retaining said core in said piston;

a plurality of annular disc members on said end face of said core for reducing heat transfer from the brake shoe to said actuating piston;

a removable cover member over said end face and said disc members for retaining said disc members on said end face; and

removable fastening means extending through said cover member fixedly engageable only with said longitudinal bore in said core through the central openings in said annular disc members for removably retaining said cover member on said core, whereby removal of said fastening means allows access through said bore to the inner end face of said core for pressurizing a space between said end face and base to remove said core from said piston.

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COMBINATION NORMAL-SOWING AND FINE-SOWING WHEEL WITH INTEGRAL STOP

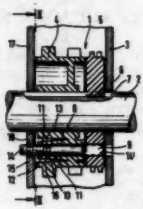
Bernd Gattermann, Hude i.O.; Bernhard Steenken, Sogel; Franz Grosse-Scharmann, Hude i.O., and Horst Müller, Georgsmarienhütte, all of Fed. Rep. of Germany, assignors to Amazonen Werke, H. Dreyer GmbH. Co. KG, Hasbergen-Gaste, Fed. Rep. of Germany

Filed Aug. 1, 1986, Ser. No. 893,123

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527759; Jan. 22, 1986, 3605768

Int. Cl.[4] A01C *7/12*; F16D *67/02*

U.S. Cl. 192—18 R **16 Claims**



1. In a sowing machine having a combination normal-sowing and fine-sowing wheel said normal-sowing wheel having a central bore and being freely rotatably mounted on a sowing shaft passing through the central bore for rotation relative thereto in a sowing housing of the machine, said fine-sowing wheel also having a central bore and being fixedly mounted on the sowing shaft with said sowing shaft passing through the central bore of the fine-sowing wheel, said fine-sowing wheel being disposed adjacent to the normal-sowing wheel in the sowing housing, means for coupling the normal sowing wheel to the fine-sowing wheel for rotation therewith comprising a coupling bolt, means slidably mounting the coupling bolt on the normal-sowing wheel, means on the fine-sowing wheel for coacting with the coupling bolt to rotatably couple the two wheels and means for securing the bolt in one operating position wherein the two wheels are rotatably uncoupled with said normal-sowing wheel being fixed to said housing and another operating position wherein the two wheels are rotatably coupled, the improvement wherein the mounting means comprises means forming a second bore on the normal-sowing wheel for slidably receiving the coupling bolt and wherein the securing means comprises means forming at least one stop is wherein the means forming the at least one stop and the means forming the second bore are in one piece with each other and made out of plastic.

4,798,272

HYDRAULICALLY OPERATED FRICTION CLUTCH HAVING AUTOMATIC WEAR COMPENSATING VALVE

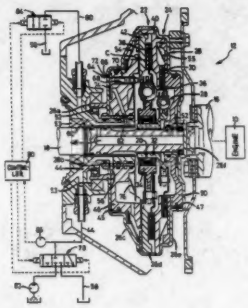
Kiyohito Murata, Susono, and Fumihiro Ushijima, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 3, 1987, Ser. No. 33,616

Claims priority, application Japan, Apr. 4, 1986, 61-78845

Int. Cl.[4] F16D *13/75, 25/063*

U.S. Cl. 192—70.25 **13 Claims**



1. A hydraulically operated friction clutch, comprising:

a driving rotary member;

a driven rotary member frictionally engageable with said driving rotary member;

a movable member disposed coaxially with said driving and driven rotary members, and axially movable for frictional engagement of said driving and driven rotary members with each other;

means for defining a cylinder bore;

an actuator piston axially slidably received within said cylinder bore, and cooperating with said cylinder bore to define a pressure chamber;

a first control valve for selectively applying a hydraulic pressure to said pressure chamber and thereby moving said actuator piston from a first stable position to move said movable member for the frictional engagement of said driving and driven rotary members;

means for defining a discharge passage leading to a drain;

said actuator piston having a through-hole, and a control passage which communicates at opposite ends thereof with said pressure chamber and said discharge passage;

a shut-off valve disposed in operative association with said actuator piston and said movable member, said shut-off valve including a shaft member slidably received within said through-hole, and a closure member which is movable relative to said actuator piston and which has a first position for closing said control passage, and a second position for opening said control passage, said closure member being placed in said second position when said actuator piston has been moved to a second stable and ready-to-operate position which is a predetermined first distance away from said movable member;

one of opposite ends of said shaft member projecting a predetermined second distance from a surface of said actuator piston facing said movable member, when said closure member is placed in said first position, said first distance being smaller than said second distance;

a second control valve disposed in said discharge passage, for selectively closing said discharge passage such that said actuator piston can move to a third stable position; and

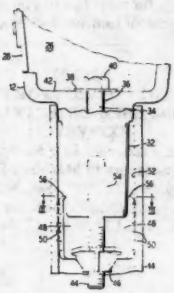
a controller generating electric signals for controlling said first and second control valves.

4,798,273

PARKING METER ANCHOR

Seth Ward, II, Little Rock, Ark., assignor to POM Incorporated, Russellville, Ark.

Filed Nov. 6, 1986, Ser. No. 927,375
Int. Cl.[4] G07F 9/00
U.S. Cl. 194—350 3 Claims



1. A parking meter for mounting on a hollow post, comprising:

a head including a parking time indicator and an opening for receiving coins and the like;

a vault chamber mounted below said head for receiving the coins and the like received in said opening and including an openable door;

a tapered mounting base extending from said vault chamber and received in the hollow post, said mounting base including a plurality of beveled surfaces and an opening extending through said mounting base and opening into an interior of the hollow post;

a mounting bolt extending through said opening in said mounting base, said mounting bolt including means for rotating said mounting bolt from within said vault member;

an anchor nut threadably received on the portion of said mounting bolt extending into the interior of the post; and

a plurality of expansion wedges of substantially rectangular shape mounted on said anchor nut for restricted longitudinal movement and for free radial movement, said plurality of expansion wedges being flat and including a plurality of angular teeth on first and second opposite sides of said expansion wedges, said first and second opposite sides being urged against and in engaging contact with an inside surface of the post, a top edge of respective ones of said expansion wedges being in contact with said plurality of tapered surfaces of said mounting base to urge said angular teeth on opposite sides of said expansion wedges against said inside surface and prevent removal of said parking meter from the hollow post.

4,798,274

BALUSTRADE FOR A PASSENGER CONVEYOR

Cyuichi Saito, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 15, 1986, Ser. No. 907,093
Claims priority, application Japan, Sep. 20, 1985, 60-206514; Nov. 29, 1985, 60-267167
Int. Cl.[4] B65G 15/00
U.S. Cl. 198—324 11 Claims

5. A balustrade for a passenger conveyor comprising:

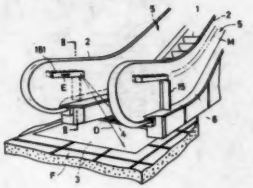
a deck cover provided in said conveyor on an opposite side to a plurality of steps arranged endlessly for conveying passengers from one landing to another landing;

a transparent balustrade panel supported on said deck cover and having an inner surface opposite to said steps and an outer surface opposite to said inner surface;

a handrail;

a handrail guide frame, fixed to an upper edge of said balustrade panel, for guiding said handrail moving in synchronism with said steps;

an illumination device fixed directly to said outer surface of said balustrade panel so as to be spaced from said handrail by a distance thereby providing upper and lower transparent portions of said balustrade panel around one of said landings, said illumination device being higher than the middle of said balustrade panel between said handrail guide frame and said deck cover;



a decorative member provided on said balustrade panel on the opposite side to said illumination device;

a display portion provided in said decorative member, said display portion including a light-permeable portion which is illuminated by light from said illumination device; and

a supporting pole disposed between said deck cover and said illumination device, said supporting pole having a channel with substantially U-shaped walls when viewed in a direction perpendicular to the axial direction of said supporting pole, and holding lead wires of said illumination device, said supporting pole with said transparent panel providing a sole support for said illumination device.

4,798,275

LINE-SHAFT CONVEYOR DIVERTER

Hendrik Leemkuil, Pickerington, and Robert E. Slyh, Jr., Mt. Sterling, both of Ohio, assignors to Versa Corporation, Mount Sterling, Ohio

Filed Jun. 30, 1986, Ser. No. 879,993
Int. Cl.[4] B65G 47/53
U.S. Cl. 198—372 19 Claims

1. A diverter assembly for use with a conveyor to divert objects from a transfer surface of the conveyor; said diverter assembly comprising:

(a) a stationary frame portion and a portion lift portion;

(b) diverter means mounted on said frame lift portion;

(c) a powered drive wheel mounted on said stationary frame portion;

(d) a power transfer wheel mounted on said frame lift portion;

(e) a drive loop mounted on said powered drive wheel and said powered transfer wheel to transfer power from said power drive wheel to said transfer wheel to rotate same;

(f) drive means transferring power from said transfer wheel to said diverter means to power same from energy derived from said powered drive wheel;

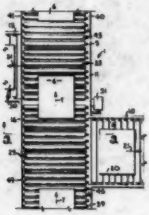
(g) said frame lift portion being mounted on said stationary frame portion for vertical movement between a first recessed position and a second diverting position;

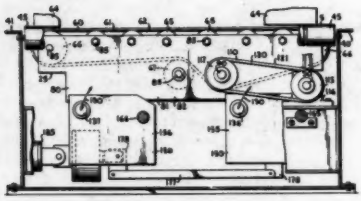
(i) said first position having said diverter means oriented with an upper engagement portion thereof recessed below the transfer surface of the conveyor and out of potential diverting engagement with objects on the conveyor transfer surface;

(ii) said second position having said upper engagement portion of said diverter means raised above the transfer surface of the conveyor for selected diverting engagement with an object thereon; and

(h) lift means for selectively moving said frame lift portion between said first and second positions;

(i) said lift means including arc movement means providing that movement of said frame lift portion occurs along a substantially arcuate path while maintaining a substantially constant distance between said powered drive wheel and said power transfer wheel during arcuate movement;





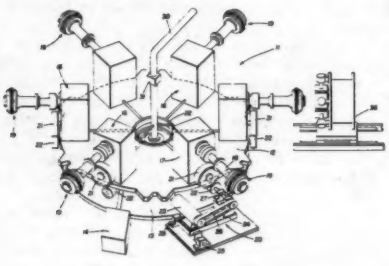
(i) whereby an object upon the conveyor transfer surface may be selectively diverted by actuation of said lift means to lift said diverter means into engagement with the object; the object, once engaged, being selectively diverted by means of power derived from said powered drive wheel.

4,798,276

SHAPING TURRET

Earl F. Loeffler, Uniontown, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 17, 1983, Ser. No. 458,680
Int. Cl.[4] B65G *17/32*
U.S. Cl. 198—378 **1 Claim**



1. An apparatus for shaping a tire, comprising:

(a) turret means adapted to be rotated about an index axis;

(b) a plurality of drive units affixed to said turret means and adapted to be rotated therewith about said index axis and positioned at a plurality of workstations about said turret means having control means associated with at least one of said drive units which is responsive to the workstation at which said drive unit is positioned, wherein a drive member is associated with at least one of said drive units which frictionally engages a drive member at the workstation at which said drive unit is positioned;

(c) tire retaining means associated with said drive units; and

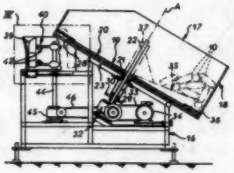
(d) loading means for placing a tire on one of said tire retaining means at one of said workstations.

4,798,277

DISTRIBUTION DEVICE FOR DELIVERING VERTICALLY DISPOSED OBJECTS ONE BY ONE TO A CONVEYOR

Jean-Louis Dubuit, Paris, and Eric Rouly, Pontault Combault, both of France, assignors to Machines Dubuit, Paris, France

Filed Jan. 27, 1987, Ser. No. 7,086
Claims priority, application France, Jan. 27, 1986, 86 01077
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—397 **30 Claims**



1. Distribution device for delivering in vertical orientation objects one by one to a horizontal conveyor, comprising a hopper adapted to receive the objects randomly and having an inclined axis, an inclined disk constituting the bottom of said hopper and adapted to rotate about said axis, a plurality of openings at the periphery of said disk each adapted to receive one object, an inclined plate beneath and parallel to said disk, a release opening in an upper part of said plate aligned with the path of movement of said openings as said disk rotates, a plurality of vertical chute members between said hopper and said conveyor adapted to move under said release opening and each adapted to receive the objects one by one and orient them vertically, said vertical chute members being through chute members each having an inlet end and an outlet end with said outlet end being adapted to be in immediate overlying relation with said conveyor to transfer objects to said conveyor, and an endless loop intermediate conveyor carrying said chute members and adapted to be driven synchronously with said disk, said intermediate conveyor having one part passing under said upper part of said plate and another part passing over said conveyor.

4,798,278

CONVEYOR FOR TURNING PACKAGES UPSIDE DOWN

Vincent Cornacchia, Paramus, N.J., assignor to General Machine Design, Inc., Saddle Brook, N.J.

Filed Jul. 23, 1987, Ser. No. 76,703
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—399 **11 Claims**

1. An in-line conveyor type machine for turning at least one package upside down, said machine comprising:

a feed conveyor means, including a drive means for said feed conveyor means;

a first gate means interconnected with said feed conveyor means;

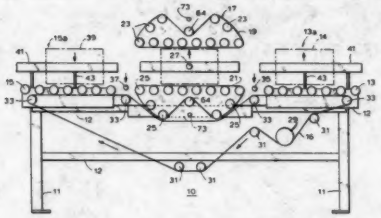
means for activating said first gate means for closing and opening said first gate means;

a rotatable turning means including conveying means thereof operatively interconnected with said first gate

means, wherein said first gate means admits at least one package into said turning means upon opening of said first gate means, said conveying means presenting a first moving surface and a drive means therefor;

a discharge conveyor means including a drive means for said discharge conveyor means;

a second gate means interconnected with said discharge conveyor and interconnected further with said turning means and with said first gate means; and



means for intermittent rotational operation of said turning means interconnected with said first and second gate means, said means for intermittent rotational operation including a drive means presenting a second moving surface, said second moving surface engaging said first moving surface for tumbling said turning means in said intermittent rotational operation;

said drive means for said feed and discharge conveyor means further being interconnected with said drive means for said first moving surface of said conveying means of said turning means.

4,798,279

MINE HAULAGE METHOD AND APPARATUS

Richard E. Doerr; Margaret A. Roberts, both of Morgantown, and Harry J. Brown, Barrackville, all of W. Va., assignors to Consolication Coal Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 822,100, Jan. 24, 1986, abandoned. This application Dec. 5, 1986, Ser. No. 935,290

Int. Cl.[4] B65G *15/26*

U.S. Cl. 198—594 **2 Claims**

1. A method for conveying material along a curvilinear path for continuously transporting mined material for a determined distance from a continuous mining machine in a mine having a roof and a floor, comprising:

(a) installing a fixed, extendable length conveyor in said mine along a floor, said fixed conveyor extending to said continuous mining machine less said determined distance;

(b) installing an overhead rail supported conveyor along and above said fixed and extendable length conveyor having at least a length equal to said determined distance, said overhead rail supported conveyor likewise including a pivotal feed;

(c) installing a tramming conveyor having a length at least equal to said determined distance, between the said pivotal feed of said overhead rail supported conveyor and said mining machine;

(d) pivoting said feed end of said overhead rail supported conveyor downward to couple to said tramming conveyor and receive discharges from said tramming conveyor;

(e) progressively moving said tramming conveyor along with said coupled overhead rail supported conveyor said determined distance to a first position;

(f) pivoting said feed end of said overhead rail supported conveyor to a height where said overhead rail supported conveyor will clear said fixed conveyor;

(g) moving said overhead rail supported conveyor to a second position where it is suspended entirely over said fixed conveyor;

(h) extending said fixed conveyor an additional determined distance; and,

(i) moving said overhead rail supported conveyor back to said first position; and

(j) repeating steps (d), (e) and (f) until a desired amount of mining is completed.

4,798,280

MEASURING DEVICES

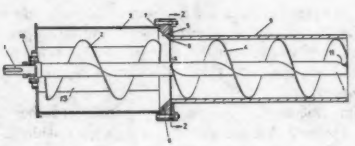
Hubert L. Hornhardt, Beverley, and Geoffrey G. Nuske, Cheltenham, both of Australia, assignors to Alf. Hannaford & Co. Pty. Ltd., Beverley, Australia

Filed Aug. 31, 1983, Ser. No. 528,263

Claims priority, application Australia, Aug. 31, 1982, PF5657

Int. Cl.[4] B65G *33/32*

U.S. Cl. 198—666 **3 Claims**



1. Measuring apparatus including a measuring conduit having a measuring cylindrical bore, a measuring auger within the cylindrical bore and having an axial shaft coaxial with the bore, the outer edge of the measuring auger closely fitting within the bore and extending continuously along a measuring length, the measuring length commencing at an inlet end of the bore, and terminating at an outlet end of the bore, the measuring auger at the inlet end of the bore having an abruptly inclined edge approaching the auger edge closest to the said inlet end of the bore, a feed auger supported by the said axial shaft and constrained to rotate therewith, the pitch of the feed auger being greater than the pitch of the measuring auger, the feed auger being located with an outlet end adjacent and axially spaced from the inlet end of the bore, and the housing and the feed auger being shaped and otherwise arranged so as to allow particulate material, where this is being urged toward the inlet end of the measuring bore, to be diverted from between the measuring bore and the feed bore, where excess to any take-up of such particulate material by the measuring auger exists.

4,798,281

CARRIER FOR USE ON A DRAG CHAIN CONVEYOR

Walter C. Egger, Zurich, Switzerland, assignor to VT-Verpackungstechnik Zurich, Zurich, Switzerland

Continuation-in-part of Ser. No. 603,247, Apr. 23, 1984, abandoned. This application May 15, 1986, Ser. No. 864,092

Claims priority, application Switzerland, Apr. 26, 1983, 2215/83; Mar. 5, 1984, 1078/84

Int. Cl.[4] B65G *15/44*

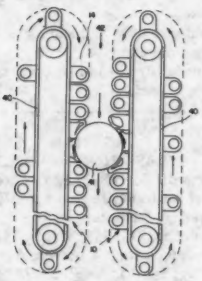
U.S. Cl. 198—698 **9 Claims**

1. A carrier member for use on a drag chain conveyor arranged to convey generally elongate articles, the carrier member comprising:

a holder adapted to be connected to a link of the chain conveyor, the holder having a plate;

a resilient gripper member having an axis which is substantially perpendicular to the direction of conveyance of the drag chain conveyor and substantially parallel to the axes

of the elongate articles and adapted to be conveyed by the carrier member, the gripper member having a hollow open-ended tubular portion with the axis thereof being substantially perpendicular to the direction of conveyance and a base portion engaging the plate and a gripping surface on the tubular portion, the gripper member being adapted to deform so as to substantially conform to and



engage the area of an article it contacts, such deformation being facilitated as a result of the hollow open-ended tubular portion, with the area of contact being substantially increased as a result of deformation of the gripper member; and

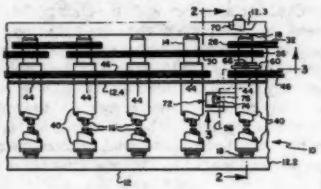
securing means for securing the gripper member to the holder such that the securing means are unable to come into direct contact with the elongated articles.

4,798,282

ZONING CONVEYOR

Bernard D. Sperduti, Amherst, and James A. Cerankowski, West Seneca, both of N.Y., assignors to HiTech Robotics Ltd., Buffalo, N.Y.

Filed Nov. 17, 1987, Ser. No. 121,650
Int. Cl.[4] B65G *13/06*
U.S. Cl. 198—781 **12 Claims**



1. A zoning conveyor comprising

frame;

a plurality of drive rollers mounted on said frame;

drive means mounted on said frame and capable of driving said rollers in such a manner that all rollers are driven at the same rotational speed;

a sleeve journalled about each of said rollers, each sleeve normally rotating with the roller about which it is journalled by frictional contact therewith, but each sleeve being capable of being held from rotation during rotation of the roller about which it is journalled;

connecting means interconnecting selected sleeves within a selected zone in such a manner that the selected sleeves within the zone all have the same rotational speed; and

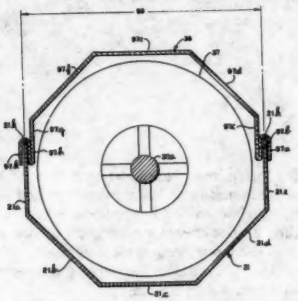
stop means mounted on said frame and capable of stopping at least one of said selected sleeves within said zone from rotating whereby all selected sleeves within that said zone are caused to be stopped from rotation by said connecting means.

4,798,283

BREADING MACHINE

Raymond E. Booth, Sandusky, and Michael E. Miller, Bellevue, both of Ohio, assignors to Stein Associates, Inc., Sandusky, Ohio

Division of Ser. No. 421,169, Sep. 22, 1982, Pat. No. 4,496,084.
This application Sep. 10, 1984, Ser. No. 648,813
Int. Cl.[4] B65G *21/00*
U.S. Cl. 198—860.5 **6 Claims**



1. A vertical joint structure extending longitudinally of a housing enclosing a generally vertical screw conveyor having an axial driving shaft adapted for forming part of a larger machine; comprising a housing of generally octagonal section composed of two hollow half portions, each generally C-shaped in section and each composed of three full sides of said generally octagonal section plus a portion of each of two more sides, said portions of each of two sides being equal in size for each of said half portions and all parallel with each other and parallel with the axis o said driving shaft; said half portions assembled with their open sides mutually meeting and joining along two longitudinal zones approximately diametrically opposed in said housing and parallel to said axis of said driving shaft, and said housing having a central longitudinal axis coinciding with said shaft axis; means closing the open top and bottom of said housing; said housing half portions consisting of formed sheet material; there being openings in said housing near the top and the bottom thereof for inlet and outlet of material moved by said conveyor and said housing being otherwise generally imperforate; each of said longitudinal joints comprising, in a first of said half portions, a straight sheared edge of said sheet material parallel with said shaft axis, said sheared edges being the terminal edge of said C-shape and forming a first linear sealing surface; each of said longitudinal joints, in a second of said half portions, comprising at each terminal edge of said C-shape, a U-shaped trough parallel with said shaft axis and the full axial length of said second half portion, said trough being formed by first bending said sheet material at said terminal edge one hundred eighty degrees outward from said terminal edge to form a first planar surface perpendicular to a plane running axially along said shaft axis, said first planar surface also being parallel to said shaft axis, then again bending said sheet material outward one hundred eighty degrees to form a second planar surface a moderate fraction of an inch separated from said first planar surface and parallel with said first planar surface thus forming a second linear sealing surface at the bottom of the trough; and means for releasably clamping said housing half portions with said first and second sealing surfaces tight together.

4,798,284

BOX FOR STORING THIN OBJECTS

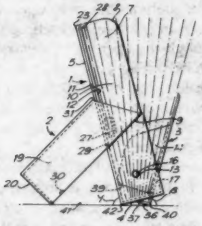
Thomas C. V. Wakelin, Bramcote, 1 Norris Close, Whitehill, Bordon, Hampshire GU35 9EG, United Kingdom

Filed Jun. 4, 1987, Ser. No. 58,193

Claims priority, application United Kingdom, Jun. 5, 1986, 8613705; Jun. 5, 1986, 8613706; Jun. 5, 1986, 8613707; Nov. 4, 1986, 8626348

Int. Cl.[4] B65D *85/57*

U.S. Cl. 206—45.15 23 Claims



1. a box in combination with thin objects, comprising:

a plurality of thin objects forming a stack capable of fanning out at their top portions from being compressed at their lower portions

means supporting said stack of said objects in a substantially upright position for selection amongst them, said support means including a support surface disposed beneath said objects at least when said stack is arranged substantially upright;

means for compressing said stack of thin objects at the level of lower portions thereof to cause them to fan out at upper portions thereof, said compression means including:

a movable member spaced from and movable crosswise of said support surface to bear at one side of said stack against an outside one of said stack of objects for compression of them, and

a reaction member positioned to bear at the other side of said stack against an outside one of said stack of objects for reacting said compression of said objects caused on movement of said movable member, a lower portion of said movable member moves toward said reaction member to decrease the distance therebetween and compress said objects.

11. A box for storing thin compressible objects, comprising:

an outer part and an inner part connected to said outer part, said outer part covering said objects in a closed position of said box and supporting said inner part at a leaning back inclination in an open position of said box;

means for supporting a stack of said objects in a substantially upright position for selection amongst them, said support means including a support surface disposed beneath said objects at least when said stack is arranged substantially upright;

means for compressing said stack of thin objects at the level of lower portions thereof to cause them to fan out at upper portions thereof, said compression means including:

a reaction member positioned to bear at one side of said stack against an outside one of said stack of objects, and

a movable member spaced from and movable crosswise of said support surface to bear at the other side of said stack against an outside one of said stack of objects for compression of them, said movable member having side wings, said side wings of said movable member including means for pivoting said movable member to said inner part for movement into a compression position compressing said lower portions of said objects between said movable and reaction members; said inner part having pair of side members adjacent said side wings; pivotal limitation means operatively connecting said side wings and said inner part for limiting forwards pivotal movement of said movable member to said compression position.

4,798,285

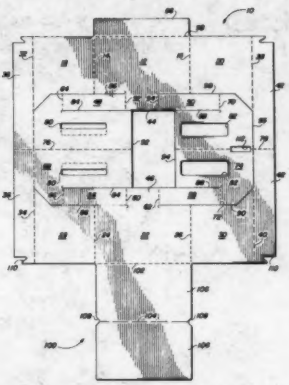
BASKET-TYPE CARRIER FOR ELONGATED ARTICLES

Kenneth J. Hernandez, Monroe, La., assignor to Manville Corporation, Denver, Colo.

Filed Dec. 7, 1987, Ser. No. 129,567

Int. Cl.[4] B65D *75/00*

U.S. Cl. 206—180 10 Claims



1. A basket-type article carrier, comprising:

a bottom panel having side edges;

side panels foldably connected to the side edges of the bottom panel and having end edges;

end panels foldably connected to the end edges of the side panels;

riser panels connected to the end panels centrally of the end panels;

a center support panel connected to and extending between the riser panels;

at least one partition strap extending between the center support panel and each side panel to divide the carrier on either side of the center support panel into cells for receiving articles to be carried, the cells having a depth corresponding to the distance between the center support panel and the side panels and a width corresponding to the distance between the partition straps and the end panel nearest thereto;

the partition straps being connected by fold lines to the center support panels and to the associated side panel; and

the distance between the fold lines connecting the partition straps to the center support panel and the end panel nearest thereto being substantially less than the length of the partition straps, whereby the cells are adapted to receive articles having an elongated transverse cross-sectional shape.

4,798,286

BOTTLE HOLDER

Peter R. Muscanelli, 238 Cherry St., Schenectady, N.Y. 12306

Filed Aug. 24, 1987, Ser. No. 88,906

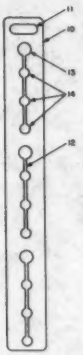
Int. Cl.[4] B65D *71/00*

U.S. Cl. 206—150 3 Claims

1. A bottle holder comprising a long, flat strap made of plastic material of uniform thickness and having an upper end from which the strap is adapted to be supported, a handle opening in the upper end of the strap for carrying the bottle holder or suspending it from a support, a longitudinal slot in the strap for receiving the necks of a plurality of bottles and

supporting the plurality of bottles in a row, one above the other, in generally perpendicular relation to the plane of the strap and an enlarged opening slightly wider than the slot and the neck of the bottle to be supported, said opening being spaced beneath the handle opening and the upper end of the slot and being in open communication with the upper end of the slot for the insertion of the neck of a bottle, which is then displaced downwardly and guided into the narrow portion of the slot to grip the neck tightly and support it from the strap.

2. A bottle holder comprising a long strap having an upper



end from which the strap is adapted to be supported, a longitudinal slot in the strap for receiving the necks of a plurality of bottles and supporting the plurality of bottles in a row, one above the other, in generally perpendicular relation to the plane of the strap, an enlarged opening communicating with the upper end of the slot for the insertion of the neck of a bottle, which is then displaced downwardly into the narrower portion of the slot to grip the neck tightly and support it from the strap and spaced-apart neck locating-openings in the slot separated by narrow portions of the slot to position the bottles and space them one above the other.

4,798,287

SYSTEM FOR INTRODUCING FLOWABLE ADDITIVE INTO A CLOSED CONTAINER

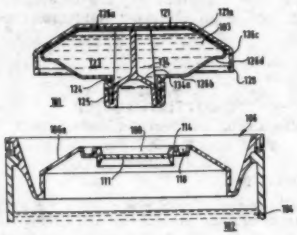
Michael H. Groves; Digby R. Redshaw, both of Warwick, and Michael R. Cane, Stockton, all of England, assignors to Imperial Chemical Industries plc, London, England

Filed Jun. 12, 1987, Ser. No. 61,423

Claims priority, application United Kingdom, Feb. 12, 1987, 8703205

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—219 **19 Claims**



1. A system for introducing a flowable additive to paint, varnish, woodstain or the like contained in a closed container wherein the system comprises:

(a) a closed container containing paint, varnish, woodstain or the like, the container being provided with an inlet which is closed by an inlet closure, but which is openable by a force exerted on the inlet closure,

(b) a closed capsule separate from the closed container, which capsule comprises a chamber which defines a volume, which contains a flowable additive and which chamber can be opened to create an opening in the chamber, which opening can communicate with the inlet into said container after the inlet has been opened,

(c) means for use in positively expelling additive from the chamber through the opening by contracting the volume defined by the chamber and,

(d) co-operable locating means provided on the container and capsule which can at least assist in locating said opening created in the chamber in communication with the inlet into the container,

wherein the container and the capsule are provided with one of co-operable snap fit sealing means and co-operable press fit sealing means, which can co-operate to provide a replacement closure for the container inlet so as to prevent spillage from the container after the inlet closure has been opened.

4,798,288

PLASTIC PACKING HAVING MULTIPLE COMPARTMENTS FOR SOLID AND LIQUID PRODUCTS

Günter Holzner, Carouge, Switzerland, assignor to Firmich SA, Geneva, Switzerland

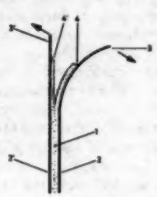
PCT No. PCT/CH82/00005, § 371 Date Sep. 28, 1982, § 102(e) Date Sep. 28, 1982, PCT Pub. No. WO82/02700, PCT Pub. Date Aug. 19, 1982

PCT Filed Jan. 14, 1982, Ser. No. 432,917

Claims priority, application Switzerland, Feb. 5, 1981, 758/81

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—222 **5 Claims**



1. Plastic packing having multiple compartments for liquid and solid materials, characterized in that it comprises a joint common to both compartments constituted by at least two sheets of polymer material, one of which is polymer foam material and ruptures internally along a longitudinal axis without the external walls of the packing rupturing, when an external pressure is applied to one of the compartments.

4,798,289

LOCKING TROLLEY FOR GARMENT BAG WITH HANGER RETAINING PADS WHICH INHIBIT UNINTENDED HANGER WITHDRAWAL

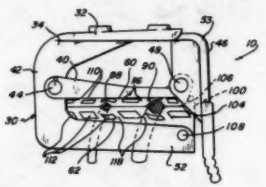
Lawrence R. Mobley, Aurora, Colo., assignor to Samsonite Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 754,617, Jul. 12, 1985, Pat. No. 4,640,414, which is a continuation-in-part of Ser. No. 673,353, Nov. 23, 1984, Pat. No. 4,618,058. This application Oct. 10, 1986, Ser. No. 917,405

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.[4] B65D *85/18*

U.S. Cl. 206—287 **13 Claims**



1. In a trolley for suspending and retaining the hooked ends of clothes hangers in a luggage piece, comprising a substantially rigid frame member generally of a C-shaped configuration which has a rear portion extending downward and a lower portion extending forward from the rear portion and which defines an opening extending into the frame member from a front location thereof, the rear and lower portions generally surrounding the opening at rear and lower locations respectively, a pair of gripping structures, means for operatively connecting the gripping structures to the frame member within the opening in an oppositely facing relationship and between which the hooked ends of hangers are inserted and removed from the front location, a lower one of the gripping structures extending generally along the lower portion and terminating at the front location, the lower gripping structure including an edge which contacts the hanger ends and a plurality of internal holes formed into the lower gripping structure at locations spaced longitudinally between the front and rear locations, the holes defining and separating a plurality of ribs, each rib extending toward the edge and rearwardly away from the front location, and the lower gripping structure including a lip which curves upward and forward at the termination of the gripping structure at the front location.

7. A trolley for suspending and retaining the hooked ends of clothes hangers in a luggage piece, comprising:

a substantially rigid frame member which defines an opening extending into the frame member from a front location thereof;

a pair of gripping structures;

means for operatively connecting the gripping structures to the frame member within the opening in an oppositely facing relationship and between which the hooked ends of hangers are inserted and removed from the front location; and

each gripping structure further including a continuous edge which contacts the hanger ends and which extends from the front location into the opening toward a rear location of the trolley, at least one of said pair of gripping structures further including a plurality of longitudinally spaced holes formed transversely through the gripping structure and separated by ribs of resilient flexible material, the ribs of said one gripping structure are angled such that as the ribs extend toward the edge the ribs also extend toward the rear location of the trolley, the angle of the ribs operatively creating a pawl-like resistance effect at the edge contacting the hanger end to inhibit the withdrawal of the hanger end from between the gripping structures.

10. In a trolley for suspending and retaining the hooked ends of clothes hangers in a luggage piece, comprising a substantially rigid frame member which defines an opening extending into the frame member from a front location thereof, a pair of gripping structures being formed of resilient and flexible material, said gripping structures further having an edge extending therealong which contacts the hanger ends, means for operatively connecting the gripping structures to the frame member within the opening in an oppositely facing relationship and between which the hooked ends of hangers are inserted and removed from the front location, an improvement in combination therewith comprising:

means structurally integral with and extending internally from the edge of the gripping structures for creating a resistance at the edge to the removal of the hanger ends from between the gripping structures, which resistance is created from the resiliency of the gripping structures and is greater upon movement of the hanger ends toward the front location than upon movement of the hanger ends rearwardly away from the front location, and wherein said means comprises a plurality of ribs of resilient flexible material, said ribs extending internally of the gripping structure from said edge and with the ribs creating the resistance.

13. A trolley for suspending and retaining the hooked ends of clothes hangers in a luggage piece, comprising a substantially rigid frame member generally of a C-shaped configuration which has a rear portion extending downward and an upper and lower portion extending forward from the rear portion and which defines an opening extending into the frame member from a front location thereof, the rear and lower portions generally surrounding the opening at rear and lower locations respectively, a pair of gripping structures, means for operatively connecting the gripping structures to the frame member within the opening in an oppositely facing relationship and between which the hooked ends of hangers are inserted and removed from the front location, a lower one of the gripping structures extending generally along the lower portion and terminating at the front location, the lower gripping structure including an edge which contacts the hanger ends and a plurality of internal holes formed into the lower gripping structure at locations spaced longitudinally between the front and rear locations, the holes defining and separating a plurality of ribs, each rib extending toward the edge and rearwardly away from the front location, the other gripping structure extending generally along the upper portion and including a plurality of holes formed thereinto at locations spaced longitudinally between the front and rear locations, the holes in the upper gripping structure defining and separating a plurality of upper ribs, each upper rib extending toward the lower gripping structure and rearwardly away from the front location, and wherein the lower gripping structure includes a lip which curves upward and forward at the termination of the lower gripping structure at the front location.

4,798,290

ELECTROSTATIC DISCHARGE CARTON

Judson A. Bradford, Holland, Mich., assignor to Bradford Company, Holland, Mich.

Filed Dec. 10, 1987, Ser. No. 130,900

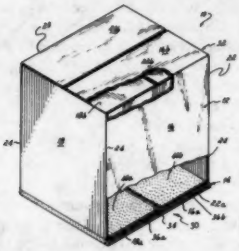
Int. Cl.[4] B65D *73/02, 85/42*

U.S. Cl. 206—328 **30 Claims**

1. A six-walled container for protecting electronic goods contained therein from damage due to electrostatic discharge constructed from a flat blank, said blank having four side walls and a pair of closure walls formed by flaps of said side walls, said side walls and flaps being joined together collectively to present a six-walled container defining a cavity for the electronic goods, and

at least one electrostatic discharge pad having one portion

residing on one side of one of said closure walls and a second portion of said pad extending between said flaps of



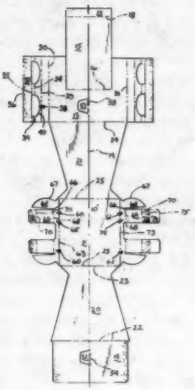
said one closure wall to the opposite side of said one closure wall.

4,798,291

DISPLAY CARRIER FOR ARTICLES

Robert G. Carver, Ashland, Ohio, assignor to Coburn, Inc., Ashland, Ohio

Filed Aug. 24, 1987, Ser. No. 88,907
Int. Cl.[4] B65D *85/44*
U.S. Cl. 206—426 **27 Claims**



1. A display carrier for articles, the carrier comprising:

opposing top and bottom walls having opposing pairs of transverse and lateral edges, said top and bottom walls each having a center line generally equidistantly spaced between their respective transverse edges;

opposing side walls hingedly attached to said lateral edges of said top and bottom walls to form a sleeve; and

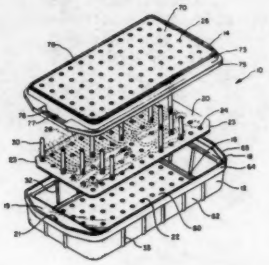
retaining means for releasably engaging an end of an article in said carrier, said retaining means having a hinged extension including deflection means hingedly extending from at least one transverse edge of said bottom wall, transversely hingedly attached to said bottom wall inside said carrier at a location between said bottom wall center line and the transverse edge at which said retaining means is hinged, and two generally transverse hinges disposed between said hinged extension and hinged attachment for deflection of said retaining means toward said bottom wall for: (i) withdrawing an article from said carrier; and (ii) inserting an article into said carrier.

4,798,292

STERILIZATION, STORAGE, AND PRESENTATION CONTAINER FOR SURGICAL INSTRUMENTS

Dennis R. Hauze, Bountiful, Utah, assignor to BioMedical Laser Industries, Houston, Tex.

Filed Apr. 3, 1987, Ser. No. 34,821
Int. Cl.[4] B65D *81/18*
U.S. Cl. 206—439 **23 Claims**



1. A container for the sterilization and storage of surgical instruments and materials and for the subsequent presentation of said surgical instruments and materials during a surgical procedure, which container comprises:

a tray comprising a bottom with spaced, permanent apertures, a peripheral shelf around the bottom, surrounding sidewalls, and a marginal flange around the upper periphery of said sidewalls;

a cover removably mounted on said tray and defining an interior chamber therewith, said cover being carried on said marginal flange of said tray and having a plurality of spaced, permanent apertures;

a removable insert board having a plurality of spaced, permanent apertures for admitting a sterilizing medium into intimate contact with said surgical instruments and materials;

and support means on said insert board for releasably supporting said surgical instruments and materials in a readily accessible manner comprising pegs configured a hollow tubes for the passage of sterilizing medium, each peg having an upper end and a bottom end, said bottom end terminating in a stop and having longitudinal slots extending an incremental distance toward said upper end, said slots forming legs in said hollow tube, said pegs being adapted to being inserted upwardly through said spaced apertures until said stop engages the bottom surface of said insert board with said legs providing a resilient engagement of said pegs in said apertures.

13. A container for the sterilization and storage of surgical instruments and materials and for the subsequent presentation of said surgical instruments and materials during a surgical procedure, which container comprises:

a first tray comprising a bottom with spaced, permanent apertures; a raised lower shelf surrounding said bottom; raised sidewalls; and an upper, raised shelf on the upper edge of said sidewalls, said raised shelf being formed as a marginal flange;

a cover adapted to be removably mounted on said first tray and defining an interior chamber therewith, said cover being carried on said marginal flange of said first tray and having a plurality of spaced, permanent apertures and forming a second tray when inverted; and

removable support means for said surgical instruments and materials comprising a first insert board having means for removing said first insert board from said first tray and from said second tray of said cover, said first insert board comprising a planar element having a plurality of peg-receiving apertures and a plurality of pegs for removable

placement in at least a portion of said peg-receiving apertures, said pegs being configured as hollow, tubular elements, each peg having an upper end and a bottom end, the bottom end terminating in a stop, said peg including a plurality of longitudinal slots extending an incremental distance from said stop and thereby forming legs in said peg, said peg including a circumferential ridge spaced from said stop and adapted to contact an upper surface of said first insert board when said peg is inserted upwardly through said peg-receiving aperture and said stop is engaged against a bottom surface of said first insert board, said slots extending above said upper surface and allowing the passage of sterilizing medium through said slots.

4,798,293

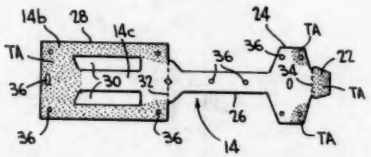
SHIRT FOLDING AND PACKAGING METHOD AND APPARATUS

Ronald Carstens, 209 Edith Point, Anacortes, Wash. 98211

Continuation of Ser. No. 869,713, Jun. 2, 1986. This application Apr. 28, 1988, Ser. No. 188,198

Int. Cl.[4] B65D *73/00*

U.S. Cl. 206—495 **13 Claims**



1. A collar board for use in packaging a shirt comprising an elongate collar band-encircling portion and a shorter shirt-front portion extending at an angle from one end of the collar band-encircling portion for encircling substantially an entire shirt collar band, the shirt front portion having a first notch adjacent the collar band encircling portion for engaging a collar button of the shirt, and a second notch spaced from the first notch for engaging another button on the shirt front adjacent the collar button wherein at least the collar band-encircling portion is coated on both surfaces with a transient adhesive wherein the adhesive consists essentially of about 5–25% (w/v) sol of a polyvinyl pyrollidone (PVP) in an organic solvent having a boiling point less than 90° C. under normal atmospheric conditions, said PVP having a molecular weight ranging from about 30,000 to about 90,000 the resulting composition being a transient cohesive.

4,798,294

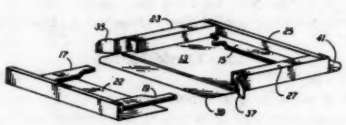
SHIPPING TRAY ASSEMBLY FOR AN ARTICLE HAVING CASTERS

Richard Bodi, Knoxville, Tenn., assignor to North American Philips Corp, New York, N.Y.

Filed Aug. 31, 1987, Ser. No. 91,673

Int. Cl.[4] B65N *19/42*

U.S. Cl. 206—600 **10 Claims**



1. A shipping tray assembly for use in shipping an article having casters extending below its bottom, said tray assembly comprising a first surface, a first raised segment on said surface for supporting a first portion of the bottom of such an article, a second raised segment on said surface for supporting a second portion of the bottom of such an article, said raised segments being high enough so that when such an article is supported on them its casters are out of contact with said surface, and holding means holding said first and second segments in fixed relationship to one another, said holding means being releasable whereby said fixed relationship can be changed, said holding means upon being released enabling said second raised segment to be removed from said tray assembly thereby providing an opening in said assembly whereby an article with casters extending below its bottom and located inside said tray assembly can have its casters lowered onto said surface and can be rolled out of said assembly through said opening.

4,798,295

PACKING CONTAINER FOR LIQUID CONTENTS

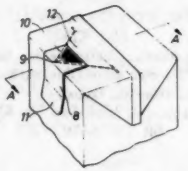
Hans Rausing, Wadhurst Park, England, assignor to AB Tetra Pak, Lund, Sweden

Filed Oct. 30, 1987, Ser. No. 115,056

Claims priority, application United Kingdom, Nov. 13, 1986, 8627150

Int. Cl.[4] B65D *5/54*

U.S. Cl. 206—621.6 **6 Claims**



1. A packing container for liquid contents manufactured of a packing material of plastic-coated cardboard and which comprises:

a container body with an inside and at least one straight side wall and an upper end wall which is joined to the side wall along a folding line so as to form a relatively sharp transition between the package side wall and the upper end wall;

a hole arranged in the upper end wall, which hole extends up to the folding line;

two weakening lines which extend from opposite edges of the hole in divergent directions over the upper end wall of the packing container up to a crease line in the upper end wall;

the hole is covered from the inside of the package by a thin thermoplastic film which constitutes the inner plastic coating of the packing material;

a cover strip is arranged over the hole and at least over parts of the upper end wall between the weakening lines and which cover strip is sealed to the thermoplastic film exposed in the hole and to the outside of the upper end wall between the weakening lines.

4,798,296

PACKING CONTAINER PROVIDED WITH A RECLOSABLE OPENING ARRANGEMENT

Jan Lagerstedt, and Kjell Mårtensson, both of Malmö , Sweden, assignors to AB Tetra Pak, Lund, Sweden

Filed Mar. 18, 1987, Ser. No. 27,569

Claims priority, application Sweden, Mar. 26, 1986, 8601396

Int. Cl.[4] B65D *5/70*

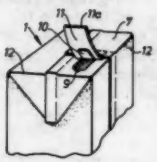
U.S. Cl. 206—631.2 **8 Claims**

1. An opening arrangement in a packing container wall comprising:

a weakened area formed by two connected lines of weakening, said weakened area defining a tongue movable away from the packing container wall during an opening opera-

tion to at least partially define the area of an opening in the packing container wall and movable toward the packing container wall during a re-closing operation to at least partially reclose the opening, and

a cover strip positioned over said tongue and sealed to the



packing container wall around the weakened area, the area of the opening being covered from the underside with a thin liquid-tight plastic film which is sealed to the inside of the container, the cover strip being sealed to the plastic film within an area of the opening adjacent said weakened area.

4,798,297

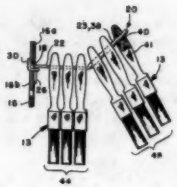
MERCHANDISING SYSTEM FOR PAINT BRUSHES AND THE LIKE

Robert L. Weiss, Wooster; Charles Jentes, Smithville, and Richard J. Crowell, Wooster, all of Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Aug. 1, 1984, Ser. No. 636,735

Int. Cl.⁴ A47B *81/02*

U.S. Cl. 211—65 **10 Claims**



1. A merchandising system for paint brushes or the like comprising: an upstanding aperture panel; at least one display hanger mounted to said aperture panel for hanging support of a plurality of paint brushes or the like from said aperture panel, said display hanger comprising a wire body bent intermediate its length at an acute angle to form a rear article storage portion and an angled front article display portion, said wire body having a rear end, attachment means at said rear end of said wire body for removably yet securely mounting said wire body to the aperture panel at an aperture therein with said storage portion extending substantially horizontally and forwardly from said panel and said display portion upwardly inclined in the vertical plane of said storage portion, each of said storage portion and said display portion being of sufficient length to accommodate and support a plurality of such brushes in axially spaced relation along each such length, and a soft resilient covering on said display portion over substantially the length thereof, said covering being operative to effect a wedging or binding action at a hole in each handle of a plurality of such brushes threaded thereon for holding each such brush upwardly inclined for easy viewing and removal; a plurality of paint brushes hanging in vertical disposition in stacked relationship from said storage portion; and a plurality of additional paint brushes supported on said display portion in stacked relationship at an upward tilt effected by a wedging or binding action of said covering at a hole in each handle of said additional brushes, which hole has a diameter slightly greater than the outer diameter of said covering on said display portion.

4,798,298

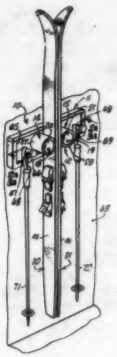
APPARATUS FOR GRIPPING SKIS OR LIKE

Chris H. Ursetta, 5800 Owensmouth #79, Woodland Hills, Calif. 91367

Filed Oct. 30, 1987, Ser. No. 114,507

Int. Cl.⁴ A47F *5/08*

U.S. Cl. 211—70.5 **20 Claims**



1. In an article supporting apparatus including a support, at least one revolvable gripping member eccentrically mounted to said support to cooperate with a second gripping member mounted to said support and between which the article is to be supported, said revolvable member having a wall facing said support,

the improvement characterized by a means for biasing said revolvable member towards a position defining a minimal width between said gripping members,

said biasing means comprising

(a) a curved slot formed in the wall of said revolvable member and about its eccentric mounting,

(b) a spring mounted in said slot, and

(c) a pin mounted in said support and extending into said slot to engage said spring.

4,798,299

PIVOT RING

Antonius L. Bayer, Rumpt; Bernhardus A. L. Bles, Woerden; Godfrey Hands, Vianen, and Dag A. Hovden, Utrecht, all of Netherlands, assignors to SKF Industrial Trading and Development Co. B.V, Nieuwegein, Netherlands

Filed Nov. 13, 1986, Ser. No. 930,699

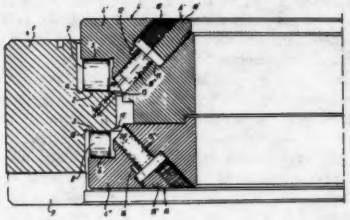
Claims priority, application Netherlands, Dec. 19, 1985, 8503517

Int. Cl.⁴ B66C *23/84*

U.S. Cl. 212—157 **9 Claims**

1. In a pivot ring assembly comprising first and second annular members, one of which is mounted within the other, said first and second annular members having first and second spaced apart races, respectively, that face one another, and rolling elements positioned to roll on said races between said first and second annular members; the improvement wherein an aperture is provided in said first annular member for receiving an ultrasonic probe, said aperture being directed toward a

critical area of said assembly, whereby an ultrasonic probe mounted in said aperture can scan said area upon relative



rotation of said annular members for detecting subsurface material defects in said assembly.

4,798,300

BOTTLE WITH INTEGRAL CAP-REMOVING RECESS

Asim Ghosh, Willowdale, and Aram H. Toukmanian, Toronto, both of Canada, assignors to Carling O'Keefe Breweries of Canada Limited, North York, Canada

Filed Mar. 2, 1988, Ser. No. 162,964

Claims priority, application Canada, Mar. 3, 1987, 531005

Int. Cl.[4] B65D *23/00, 41/12*

U.S. Cl. 215—10 **13 Claims**

1. A bottle, comprising:

a mouth,

a neck adjoining the mouth, the neck having helical rib means on the outside adjacent the mouth to permit application of a peripherally indented, screw-on crown,

a main body portion having a base,

an upward recess centrally in the base, the recess being substantially circular when seen in bottom plan,

and a plurality of inwardly projecting, substantially identical ribs around the periphery of the recess, each rib being convexly rounded and devoid of points, and having two concavely rounded shoulder portions on either side, whereby to minimize stress concentration,

the recess being sized to receive a peripherally indented crown of the same size as that receivable on the neck, such that the ribs register in at least some of the peripheral indentations, whereby one bottle can serve as a crown remover for another.

4,798,301

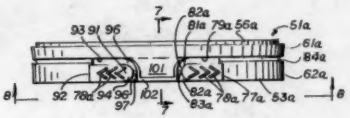
TAMPER-RESISTANT CAP FOR WIDE MOUTH JAR

Joseph J. Ballock, Atherton; Wayne L. Hatch, Gilroy, and George Tackles, San Jose, all of Calif., assignors to Cap Snap Co., San Jose, Calif.

Filed Dec. 14, 1987, Ser. No. 132,793

Int. Cl.[4] B65D *41/48*

U.S. Cl. 215—256 **11 Claims**



1. A tamper-evident cap comprising a top disk,

an outer skirt depending from said top disk having internal upper and lower locking bead means and a horizontal score line extending substantially circumferentially of said outer skirt intermediate said upper and lower bead means, said outer skirt being cut away adjacent its lower edge to form a horizontally elongated tear tab, said tear tab being radially outwardly offset relative to the outer circumference of a major portion of said outer skirt to provide a space inside said tear tab for insertion of a finger or fingernail to grasp said tear tab.

4,798,302

CLOSING DEVICE FOR A HOLDER AND DIAPHRAGM FOR SUCH A DEVICE

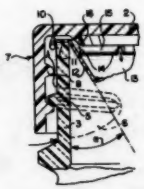
Cornelis Killestijn, Prinsenbeek, Netherlands, assignor to Skillpack B.V., Etten-Leur, Netherlands

Filed Mar. 28, 1988, Ser. No. 174,205

Claims priority, application Netherlands, Apr. 13, 1987, 8700871; European Pat. Off., Jan. 20, 1988, 88200101.9

Int. Cl.[4] B65D *39/12, 53/00*

U.S. Cl. 215—271 **7 Claims**



1. Closing device (7, 37, 67) for closing a holder opening (6) comprising at least a cover (2, 32, 62) arranged over said opening (6) and a diaphragm (1, 31, 61) arranged between an edge (11) of said holder opening (6) and said cover (2, 32, 62), said diaphragm being essentially elastically and/or plastically deformable in its plane, and/or having a shape which in unloaded state deviates essentially from the flat form, whereby a space (15, 45) present between cover (2, 32, 62) and diaphragm (1, 31, 61) is in contact with the atmosphere via at least one passage (14, 60), characterized in that said diaphragm (1, 31, 61) has on the upper side of its edge (10, 57) at least one groove (14, 60) for placing said space (15) present between cover (2, 32, 62) and diaphragm (1, 31, 61) in contact with the atmosphere, and that present between holder (4, 34, 64) and cover (2, 32, 62) are active connecting means (5, 8, 68), each of which are releasable.

4,798,303

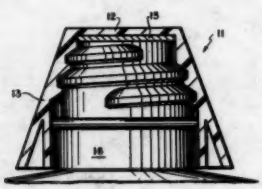
CONTINUOUS THREAD CLOSURE ASSEMBLY

Donald L. Arnold, Madison, Conn., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 038,685, Apr. 15, 1987, abandoned. This application Jan. 14, 1988, Ser. No. 143,794

Int. Cl.[4] B65D *41/04*

U.S. Cl. 215—329 **4 Claims**



1. A continuous thread closure assembly which comprises:

(a) a container having only about two full turns of a continuous thread finish of a Type A, Type B or modified buttress profile thereon which has a progressively increasing thread diameter in a direction away from the outlet of the container at a conical angle of at least about 40°; and

(b) a screw cap having a top with a counterpart thread configuration to that of the container on the inside surface thereof which directly engages with the thread finish on the container in such a manner that the lowest thread of the cap passes the uppermost thread on the container and is engageable with the next lower thread course on the container to allow for less than one turn of the cap to give two full turns of thread engagement between the container and cap.

4,798,304

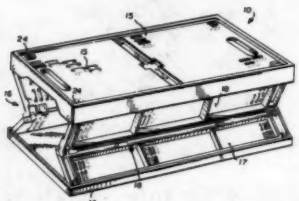
COLLAPSIBLE BOX

Helmut Rader, McLean, Va., assignor to Monoflo International, Inc., McLean, Va.

Filed Oct. 8, 1987, Ser. No. 105,573

Int. Cl.[4] B65D *7/24*

U.S. Cl. 220—6 **9 Claims**



1. A collapsible container movable from a collapsed to an operative position, and vice versa, and comprising:

two sides; two ends; an open top form comprising two side bars and two end bars; and a bottom panel; interconnected to form a generally rectangularly shaped structure;

said two sides each composed of first and second panels, said first and second panels pivotally connected at a center portion of the sides to each other, and said first panel being pivotally connected to said bottom panel, and said second panel being pivotally connected to a side bar of said top form, so that said first and second panels are pivotal with respect to each other and said top form and bottom panel about parallel side axes;

said two ends comprising end panels each of which span the distance between said bottom panel and top form when in said operative position to maintain said container in said operative position; said end panels each pivotally connected to an end bar of said top form for rotation about an end axis generally perpendicular to said side axes;

said sides, end, top form, and bottom panel all comprising plastic components;

pivotal means for pivotally connecting all of said components together, said pivotal means consisting essentially of plastic pivot pins integral with said plastic components, and means defining pivot pin receiving openings in said plastic components for receipt of said plastic pivot pins;

said pivotal means including four flexible arms extending downwardly from each of said first panels when said container is in said operative position, each of said flexible arms having a pivot pin extending outwardly therefrom, each pivot pin having a tapered free end so that the length of said pin is least nearest the bottom of said first panel; and

a pair of said arms adjacent each end of said first panel, the pivot pins of each pair of arms facing away from each other;

said bottom panel comprising a bottom plate and upstanding side walls; said pivotal means for connecting each of said first panels to said bottom panel further comprising a plurality of closed end pivot pins connected at both ends thereof to part of said first panel; and said means for receiving said closed end pivot pins comprising said bottom panel and a hooked bottom flange cantilevered to a side wall of said bottom panel.

4,798,305

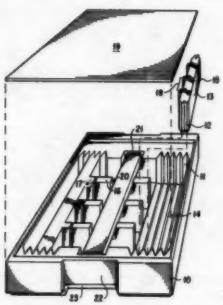
ADJUSTABLE SHIPPING TRAY

Gerald C. Laverty, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 16, 1987, Ser. No. 120,881

Int. Cl.[4] B65D *85/30*

U.S. Cl. 220—22.3 **4 Claims**



1. An adjustable tray for holding bundles of material, comprising:

a tray having an planar, solid interior bottom surface, and a first and second pair of opposing vertical walls, each wall having an interior and exterior face; and

a moveable partition with first and second vertical sides, top and bottom sides, and first and second vertical ends; and

a pattern of alternating vertical grooves and projecting teeth formed on the first and second vertical ends and the bottom side of the moveable partition, and on the interior faces of at least one pair of opposing vertical walls and the interior bottom surface of said tray; whereby, the moveable partition is held within the tray by the interlock of the pattern on the first and second vertical ends with the pattern on the interior faces of the opposing vertical walls,

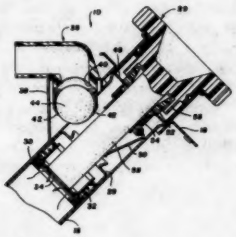
where the alternating verticle grooves and projecting teeth are of an intermeshing triangular shape.

4,798,306

FUEL TANK VENTING

Roy A. Giacomazzi, Washington Township, and Rolland D. Giampa, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1987, Ser. No. 21,765
Int. Cl.[4] B01D 53/04
U.S. Cl. 220—86 R **3 Claims**



1. In a vehicle fuel system having a fuel tank with a filler pipe having an upper end closable by a removable cap, said upper end opening to the atmosphere when said cap is removed, said system also having a fuel vapor storage canister to which said fuel tank is connected, a venting means that prevents pressurized fuel vapors generated in said tank when said filler pipe is closed from reaching the atmosphere as said cap is removed, said venting means comprising,

a valve located inside said filler pipe downstream from said filler pipe upper end, said valve being movable from a closed position blocking said filler pipe to an open position,

a fitting opening through said filler pipe intermediate said valve and said upper end, said fitting being connected to said vapor storage canister,

valve actuation means on said cap adapted to hold said valve in its closed position when said cap is in place and to allow said valve to move to its open position as said cap begins to be removed, and

seal means engageable with said cap intermediate said fitting and said filler pipe upper end, said seal means remaining engaged with said cap after said valve opens and as said cap is removed until said cap is fully removed, whereby when said cap is in place, said pressurized fuel vapors are prevented by said valve from reaching the atmosphere and also prevented from reaching said fitting, whereas when said cap begins to be removed, said valve is allowed to open and said pressurized fuel vapors are prevented from reaching the atmosphere by said seal means, and are directed instead through said fitting so as to be substantially stored in said canister by the time said cap is fully removed and said filler pipe opened to the atmosphere.

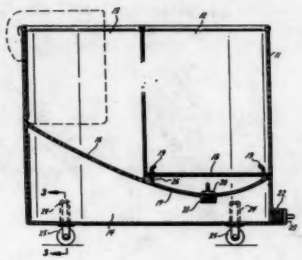
4,798,307

COMPARTMENTED CLEANING BUCKET

William E. Evrard, SS Rte., Box 312-W, West Plains, Mo. 65775

Filed Jan. 14, 1988, Ser. No. 143,757
Int. Cl.[4] A47L 13/14
U.S. Cl. 220—20.5 **2 Claims**

1. A bucket for handling cleaning liquids, comprising, a discharge storage reservoir, for containment of dirty cleaning liquid, located at the bottom of said bucket, a clean liquid reservoir, for containment of cleaning liquid, said reservoir located in a portion of the remaining volume of said bucket above and controllably connected to said discharge storage reservoir through a shaped collection floor, and further having a perforated protective shelf affixed within said clean liquid reservoir above said collection floor, and a discharge transfer compartment located in the remaining volume of said bucket above said discharge storage reservoir not occupied by said clean liquid reservoir, and adjoining said clean liquid reservoir



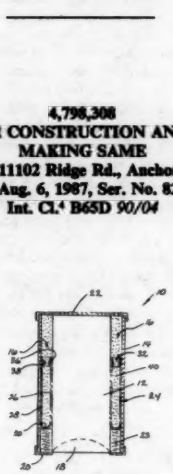
by means of a common wall between the two, and further having a drain floor at its bottom connecting it with said discharge storage reservoir by means of drain holes located in said drain floor adjacent to said common wall, said drain floor further sloping down from a high point on the outer wall of said bucket to a lower level on said common wall.

4,798,308

WATER HEATER CONSTRUCTION AND METHOD OF MAKING SAME

Thomas E. Nelson, 11102 Ridge Rd., Anchorage, Ky. 40223

Filed Aug. 6, 1987, Ser. No. 82,324
Int. Cl.[4] B65D 90/04
U.S. Cl. 220—445 **14 Claims**



1. A water heater device comprising:

a water tank;

an outer shell concentriclaly located over the water tank defining an annular space therebetween;

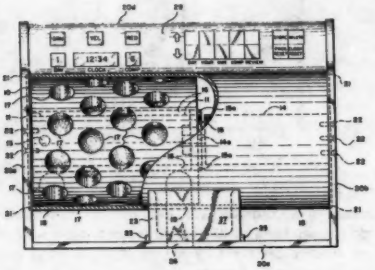
an annular pocket having an annular open top within the annular space, the annular pocket comprising an inner annular pocket wall circumferentially overlaying at least a portion of the length of the exterior wall surface of the water tank, an outer annular pocket wall circumferentially overlaying at least a portion of the length of the interior wall surface of the outer shell, and an annular bottom end wall across the space between the water tank and outer shell; and,

an insulation material filling the annular pocket.

4,798,309
PROGRAMMABLE DISPENSING APPARATUS FOR PILLS OR THE LIKE

Forrest D. Stone, Salt Lake City, Utah, and John M. Trondsen, 7521 32nd NE., Seattle, Wash. 98115, assignors to John M. Trondsen, Seattle, Wash.

Continuation-in-part of Ser. No. 841,198, Mar. 19, 1986, abandoned. This application May 7, 1987, Ser. No. 46,729
Int. Cl.[4] B65D *83/04*
U.S. Cl. 221—4 5 Claims



1. Apparatus for dispensing a multiplicity of items in sequence, comprising an elongate cylindrical container element; means mounting said container element for simultaneous rotation and axial movement on a substantially horizontal axis so that any point on its circumferential surface executes progressive spiral travel; means for effecting said rotation and axial movement comprising a reversible stepper electric motor and along which said container element moves concentrically back and forth during its spiral travel; a series of recesses in said container element opening into the outer circumferential surface thereof and extending along the length thereof in spiral formation on item-receiving compartments; an item-retaining shell within which said container element is closely fitted for said rotation and axial movement, said shell having a dispensing opening substantially corresponding to a compartment opening, said dispensing opening being located within the path of spiral travel of the series of compartment openings; and a programmable information storage and control system including microprocessor means for operating the means for effecting rotation and axial movement of the container element on a sequentially timed basis; said electric motor having a power output shaft with a hub that is provided with oppositely extending lugs, the container element being provided internally with longitudinal slots engaged by said lugs, respectively, said lugs and said slots comprising back and forth guiding means.

4,798,310
ARTICLE STORAGE CONTAINER

Kikuo Kasai, Tokyo; Kimio Kodera, Saitama, and Mitsuo Maki, Tokyo, all of Japan, assignors to Platinum Pen Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 5,276
Claims priority, application Japan, May 20, 1986, 61-113682
Int. Cl.[4] G07F *11/00*
U.S. Cl. 221—87 9 Claims

1. An article-storage container for at least one elongated article having an inner end, an outer end and a sidewall extending therebetween, with a first retaining means provided externally on the sidewall of the article,

said article-storage container comprising:

a case including means defining at least one article-accommodation chamber for removably telescopically receiving, inner end first, a respective said article,

said article-accommodation chamber having an opening through said case at an end of said article-accommodation chamber, said article-accommodation chamber being closed at an opposite end by means including an article retainer;

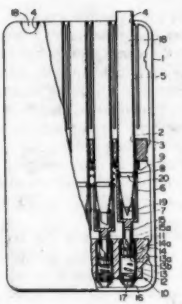
said article retainer being mounted in said case for limited axial movement towards and away from said opening;

resilient means mounted in said case and normally urging said article retainer towards said opening;

said article retainer including second retaining means adapted to engage with said first retaining means for removably retaining said article in said articleaccommodation chamber; and

a change-over mechanism including a shiftable spring-biased camming means, said change-over mechanism being mounted and disposed in said case, being operatively associated with said article retainer and said resilient means and being arranged:

for disposing said article retainer in an axially outer position with said second retaining means poised for retainingly coacting with said first retaining means when said article has been inserted in said article-accommodation chamber sufficiently to bring said first retaining means into engagement with said second retaining means and



for permitting said article retainer, against restoration force becoming stored by said resilient means, to permit said article retainer to be forcibly retracted to an intermediate position as said article is further inserted into said article-accommodation chamber, until a condition is reached at which said first retaining means is retainingly engaged with said second retaining means, said outer end of said article is approximately flush with said case perimetrically of said opening and said article retainer is cammed, by said spring-biased camming means of said change-over mechanism, in said intermediate position, against axially outward movement towards said axially outer position, and

for permitting said article retainer when latched in said intermediate position to be pushed further inwards, by a pushing force manually applied on said outer end of said article, for shifting said spring-biased camming means so that said resilient means may push said article outwardly of said articleaccommodation chamber so that a portion of said article adjacent said outer end protrudes out of said case through said opening and is available to be grasped for removing said article from said article-accommodation chamber.

4,798,311

CONTAINER PROVIDED WITH A CLOSURE

Donald J. Workum, Klosterli, Switzerland, assignor to Hafina Treuhandanz AG, Baar, Switzerland

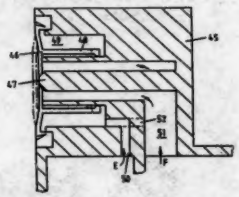
PCT No. PCT/CH85/00109, § 371 Date Jun. 4, 1986, § 102(e) Date Jun. 4, 1986, PCT Pub. No. WO86/01489, PCT Pub. Date Mar. 13, 1986

PCT Filed Jul. 8, 1985, Ser. No. 863,724

Claims priority, application Switzerland, Aug. 23, 1984, 4034/84

Int. Cl.[4] B65D *37/00*

U.S. Cl. 222—131 16 Claims



1. An apparatus, comprising:

a flexible container for a flowable product which can be dispensed in portions by the application of pressure to the container, said container having a first opening; and

a closure for the container, said closure being positioned over said opening and including an outlet valve which can be actuated by pressure from within said container, said closure with said outlet valve comprising:

a first member including a plug having a face with a sealing surface, and a support structure for said plug;

a second member having a second opening aligned with said plug, said plug being receivable in said second opening;

means defining a product flow path extending from said first opening to a position adjacent said plug such that communication with said second opening is blocked by said plug when said plug is received in said second opening;

means for moving said first and second members relative to each other from a position in which said plug is in engagement with said second opening to block said communication to a position in which said plug is spaced from said second opening to allow communication between said product flow path and said second opening such that said product can flow from said container, said moving means permitting one of said first and second members to move, and means defining a pressure flow path extending from said container to a position adjacent said movable member for transmitting pressure from said container to said movable member to space said plug from said second opening, said moving means causing said pressure flow path and said product flow path to be completely separate from each other when said plug is engaged in said second opening and when said plug is spaced from said second opening.

4,798,312

FLUID DISPENSER

John G. Scheiber, 4252 N. Rangeline Rd., Huntington, Ind. 46750

Filed Jan. 12, 1987, Ser. No. 2,456

Int. Cl.[4] B67D *5/06*

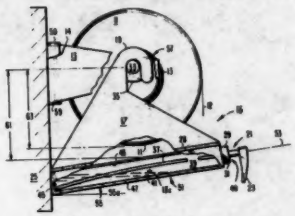
U.S. Cl. 222—180 12 Claims

1. A fluid dispensing device suitable for attachment to a paper roll dispenser comprising:

fluid container means;

suspending means attached to said fluid container means to suspend said fluid container means from the paper roll dispenser; and

fluid dispenser means on said container means arranged to pump fluid from said container means, wherein said suspending means has hinge means secured to said fluid container means for collapsing said suspending means for storage, wherein said suspending means includes a first arm and a second arm, said first arm having a first upper



end, said second arm having a second upper end, wherein said first upper end is spaced a distance from said second upper end, said distance greater than the width of the paper roll to be dispensed by the paper roll dispenser to allow said first arm and said second arm to hang on each side of the paper roll.

4,798,313

ELASTOMERIC BLADDER FOR DISPENSING ICE CREAM

Brent L. Farley, 4215 Connecticut Ave., Baltimore, Md. 21229

Filed Jul. 27, 1987, Ser. No. 78,176

Int. Cl.[4] B65D *35/28*

U.S. Cl. 222—192 6 Claims

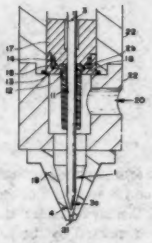
1. A progressive fluid dispensing system for continuously feeding thawing frozen confection, comprising: a resilient container having an open end and a closed end; said resilient container having a first, expanded configuration in which said frozen confection maintains the resilient container in the expanded configuration, and a second configuration in which the resilient container progressively contracts as the frozen confection thaws, whereby, thawing frozen confection flows from said open end of the container at a rate proportional to the rate of thawing of said frozen confection within said resilient container; a hollow member attached to and disposed within the open end of said resilient container and having means for whistling when a user blows air into an opening in said hollow member, and valve means at the inner end of said hollow member for preventing air from entering into said resilient container when a user blows into said hollow member.

4,798,314

DISPENSING VALVE WITH TUBULAR SEAL

John N. Worth, Bolshurst, England, and Jorn Steffensen, Helsingor, Denmark, assignors to W. R. Grace & Co., Lexington, Mass.

Filed Aug. 26, 1987, Ser. No. 89,388
Claims priority, application United Kingdom, Sep. 5, 1986, 8621470
Int. Cl.[4] F16K *41/00*
U.S. Cl. 222—542 5 Claims



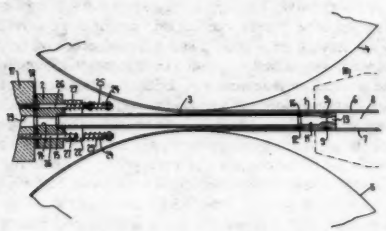
1. A dispensing means for dispensing liquid compositions comprising a dispensing chamber having an inlet and an outlet, a longitudinally movable valve means intimately fitting into the outlet for sealing off the outlet, an actuating means for selectively moving the longitudinally movable valve means, a sealing means between the valve means and the actuating means to prevent egress of liquids to the actuating means, the sealing means having a first end adjacent the actuating means, the first end having a disc-like portion which is clamped to the dispensing chamber adjacent to the actuating means, the sealing means having a second end remote from the first end, the sealing means having an internal bore from the first end to the second end through which the valve means extends, the internal bore having a tapered cross section with a larger cross section near the first end and a narrower cross section near the second end and the valve means being intimately gripped by the internal bore of the sealing means at the second end.

4,798,315

CASTING NOZZLE CONSISTING OF SEVERAL PARTS FOR FEEDING MOLTEN METAL INTO THE MOLD OF A CONTINUOUS CASTING MACHINE

Wilhelm F. Lauener, Gerlafingen, Switzerland, assignor to Larex AG, Recherswil, Switzerland

Filed Apr. 23, 1987, Ser. No. 41,468
Claims priority, application Switzerland, Apr. 30, 1986, 01787/86; Aug. 25, 1986, 03411/86
Int. Cl.[4] B22D *11/10*
U.S. Cl. 222—591 15 Claims



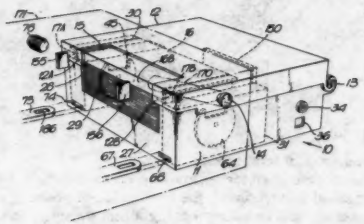
1. A casting nozzle for introducing molten metal into a mold of a continuous casting machine, comprising a mouthpiece, a tundish and a connecting part comprising tubes, the connecting part being positioned between the mouthpiece and the tundish, the mouthpiece and the connecting part being held together by pulling rods under a tension caused by elastic elements.

4,798,316

SHEET STORE

Harvey G. Martin, West Sussex; Roger Pilling, and Steven M. Hosking, both of Hampshire, all of England, assignors to De La Rue Systems, Limited, England

Filed Oct. 7, 1987, Ser. No. 106,103
Claims priority, application United Kingdom, Oct. 8, 1986, 8624192; Jan. 13, 1987, 8700704; Jan. 21, 1987, 8701253
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—43.1 12 Claims



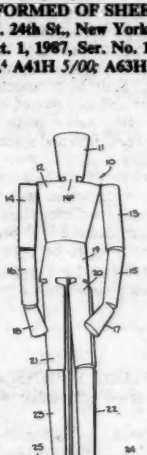
1. A sheet store comprising a container defining an opening through which sheets can pass; a pressure member in said container; biasing means, said biasing means causing said pressure member to urge sheets in said container towards said opening and being adapted to apply one of two bias forces; and control means to control the bias force applied by said biasing means.

4,798,317

MANNEQUIN FORMED OF SHEET MATERIAL

John Lonczak, 430 W. 24th St., New York, N.Y. 10011

Filed Oct. 1, 1987, Ser. No. 103,388
Int. Cl.[4] A41H *5/00*; A63H *3/08*
U.S. Cl. 223—66 6 Claims



1. An animatable mannequin providing a model of a figure having a plurality of tubular members, said mannequin being created from a single blank of flexible sheet material having paper-like qualities formed of non-woven, synthetic plastic fibers which are bonded together to form a sheet, said blank

being die-cut to define a predetermined pattern of interconnected sections which are joined together by junctions functioning as living hinges, each of which is contoured to provide when the section is rolled the tubular form of a particular member of the figure including arm, leg and feet members and includes locking tabs projecting from one edge thereof and complementary slots adjacent the opposing edge to receive the tabs, whereby each section is convertible into a locked tubular element by rolling the section and inserting the tabs thereof into the slots, the sizes and shapes of the resultant tubular elements being such as to simulate the members of the figure which because they are interhinged may be moved relative to each other.

4,798,318

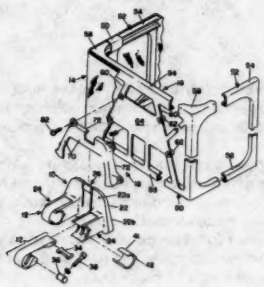
CARRIER BAG ASSEMBLY FOR BICYCLE HANDLEBARS

David Irwin, Newtown, Conn., assignor to Cannondale Corporation, Georgetown, Conn.

Filed Oct. 6, 1986, Ser. No. 915,813

Int. Cl.[4] B62J 7/06

U.S. Cl. 224—32 R **14 Claims**



1. A handlebar carrier bag assembly for bicycles comprising a bracket having a generally vertical plate portion and a pair of generally horizontal support arms extending from the back of the plate portion, means for fastening an end of each of said arms of the bracket immovably to bicycle handlebars, a bag of durable flexible material having front and back walls, side walls and a bottom wall permanently joined to each other and a top wall permanently joined to one of the front, back and side walls and adapted to be releasably joined to the others of the front, back and side walls, a substantially rigid unitary three-dimensional frame received within the bag and including a back portion having a perimeter substantially co-extensive with the perimeter of the back wall of the bag and side portions having perimeters substantially co-extensive with the perimeters of the respective side walls of the bag, a substantially rigid attachment sleeve affixed to the back portion of the frame externally of the bag and defining with a part of said frame back portion a downwardly open cavity that releasably receives from below in close-fitting relation the plate portion of the bracket, whereby the frame is mounted substantially immovably against downward and lateral movement on bicycle handlebars.

4,798,319

BALL CADDY

Virtious James, Jr., 1946 W. Romley, Phoenix, Ariz. 85041

Filed Sep. 25, 1987, Ser. No. 101,268

Int. Cl.[4] A45F 5/00

U.S. Cl. 224—251 **1 Claim**

1. A ball magazine apparatus including means for attachment to an individual utilizing said apparatus comprising,

a tubular magazine means including a closed first end and an open second end to define an exit opening, for housing a plurality of balls, and

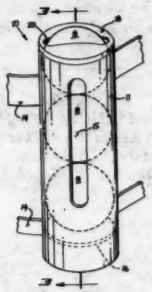
a biasing means for directing said balls towards an exit opening with a tubular magazine means, and

resilient opening means positioned over said exit opening for enabling manual sequential grasping of said ball through said resilient opening means enabling removal of said balls from said magazine means, and

said resilient opening means including a flexible membrane sheet securable over said exit opening,

said membrane sheet formed with a central circular opening including a plurality of diametrically opposed relief opening for acceptance of an individual's fingers therethrough for grasping of an uppermost ball in said magazine means,

the width of the opening defined by said relief openings and said central opening being less than that of said exit opening, and



said biasing means includes a rigid planar elevator plate means positioned over said biasing means for upwardly biasing said balls to said exit opening, and

said biasing means is captured between said first end and said elevator plate means, and

wherein said means for attachment includes spaced integral loops secured to said tubular magazine means for acceptance of spaced belt means therethrough for securement about said individual, and

wherein said central circular opening is of a diameter substantially less than that of said tubular magazine means, and

wherein an indicator relief opening is axially oriented within a wall of said tubular magazine means for visual indication of the presence or absence of balls within said magazine means.

4,798,320

CERAMIC-METAL BRAZED JOINT FOR TURBOCHARGERS

Ho T. Fang, Scottsdale, Ariz., assignor to Allied-Signal Inc., Morristown, N.J.

Division of Ser. No. 778,479, Sep. 20, 1985, Pat. No. 4,722,630.

This application Sep. 15, 1987, Ser. No. 96,688

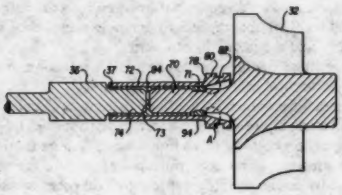
Int. Cl.[4] B23K 1/12

U.S. Cl. 228—122 **11 Claims**

7. The method of reducing the compressive forces acting on

a ceramic shaft by a surrounding sleeve member comprising the steps of:

forming an annular relief about said ceramic shaft;



brazing the sleeve member to said ceramic shaft such that only a portion of said relief is brazed to said sleeve member.

4,798,321

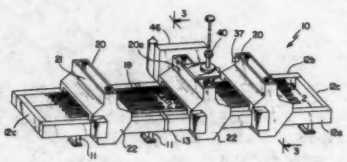
PANELIZING MACHINE AND METHOD FOR USE

Edward Moran, 54 Keefer Road, Thorold, Ontario, Canada

Filed Jul. 6, 1987, Ser. No. 70,380

Int. Cl.[4] B23K 5/22, 31/02

U.S. Cl. 228—213 **17 Claims**



10. A panelizing machine for clamping and welding a plurality of elongated structures, the machine comprising:

(a) an elongated main frame including dual elongated parallel frame members and at least two connecting cross members, each frame member being provided with a rail extending along the upper side of the frame member;

(b) at least three bed plates extending transversely across said main frame and spaced apart from each other, each said bed plate being supported by one of said cross members and each bed plate having a plurality of notches provided on the plate upper side, and adapted for receiving a plurality of elongated tubular structures in the notches;

(c) three carriages extending transversely across and supported by said main frame, each said carriage having dual end plates which have extension portions adapted to extend below the frame members and being longitudinally movable along the main frame by rollers running on said rails; and

(d) at least two vertically movable contoured clamping plates provided within each said carriage, each said clamping plate being attached on its upper side to a pressurizable hydraulic piston means, and having a plurality of notches provided on the plate lower side in vertical alignment with the notches provided on the upper side of each said bed plate, and adapted for clamping and retaining a plurality of elongated tubular structures onto the main frame; and

(e) a robot welding device mounted on the upper portion of the central of said carriages, said welding device being adapted to be positioned for making a plurality of spaced apart welds on the clamped tubular structures.

4,798,322

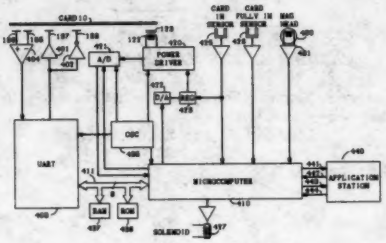
CARD READER/WRITER STATION FOR USE WITH A PERSONAL MEMORY CARD USING DIFFERENTIAL DATA TRANSFER

Howard L. Bernstein, Freehold; Thomas M. Grill, Perth Amboy, both of N.J., and Ronald Silver, Philadelphia, Pa., assignors to American Telephone and Telegraph Company, New York, N.Y.; AT&T Bell Laboratories, Murray Hill and AT&T Information Systems Inc., Morristown, both of, N.J.

Filed Apr. 28, 1986, Ser. No. 856,205

Int. Cl.[4] G06K 7/08, 7/01

U.S. Cl. 235—487 **19 Claims**



1. A card reader/writer station for use with a portable data card, the card reader/writer station including memory means for storing data and processor means for processing data and comprising:

input/output means for communicating with at least one portable data card, the input/output means being operably connected to and communicating with the processor means and memory means and including capacitive coupling means for differentially transferring data from the reader/writer station to the data card and from the data card to the reader/writer station;

energy coupling means for transmitting magnetic energy from the reader/writer station to the data card, the magnetic energy providing operating power for the data card at a constant level predetermined by the memory means, the energy coupling means including energy sensing means for sensing the level of magnetic energy being transferred to the data card and energy control means operably responsive to the memory means and the sensing means for providing the constant level of operating power to the data card; and

the capacitive coupling means and the energy coupling means providing in combination a complete communication interface between the reader/writer station and the data card.

4,798,323

WEDGE SHAPE CARTON AND BLANK

Ronald Platt, Chicago, Ill., assignor to Crane Carton Company, Chicago, Ill.

Filed Nov. 9, 1987, Ser. No. 118,443

Int. Cl.[4] B65D 5/02

U.S. Cl. 229—115 **7 Claims**

1. A blank for forming a wedge shape carton having a hinged cover, said blank comprising:

a triangular bottom panel having a base side and two converging sides extending from opposing ends of said base side,

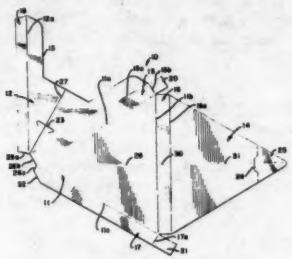
a rectangular first side wall including opposed elongate base side and opposed short end sides connecting adjacent ends of said opposed elongate base sides, one of said opposed elongate base sides being hingedly connected to one of said two converging sides,

a generally triangular top panel having a base side and two converging sides, one of said top panel converging sides

being hingedly connected to the other of said opposed elongate base sides on said rectangular first side wall along at least a greater portion of its length,

a rectangular second sidewall including opposed elongate base sides and opposed short end sides connecting adjacent ends of said opposed second sidewall elongate base sides, one of said second sidewall opposed elongate base sides being hingedly connected to said base side of said triangular bottom panel,

a generally triangular cover panel having a base side and two converging sides extending from opposing ends of said cover panel base side, said base side of said cover being hingedly connected to the other of said opposed elongate base sides on said rectangular second side wall,



a rectangular third sidewall including opposed elongate base sides and opposed short end sides extending from the other of said two converging sides on one of said triangular bottom panel and said generally triangular top panel, and

a generally rectangular fourth sidewall including opposed elongate base sides and opposed short end sides extending from the other of said two converging sides on the other of said triangular bottom panel and said generally triangular top panel for being positioned in juxtaposed lapped relation with said third rectangular sidewall and being fixed thereto.

4,798,324

VALVE AND CONTAINERS INCORPORATING THE SAME

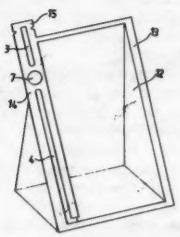
Raymond Gannon, Farnborough, United Kingdom, assignor to FGL Projects Limited, London, United Kingdom

Filed Aug. 5, 1987, Ser. No. 82,079

Claims priority, application United Kingdom, Aug. 5, 1986, 8619126

Int. Cl.[4] B65D *5/42*

U.S. Cl. 229—125.35 **16 Claims**



1. A valve comprising a conduit, formed by bonding a first sheet of flexible material to a second sheet of resilient material, one of the sheets being provided with a discrete shoulder extending towards the other sheet, the conduit being closed by reason of the shoulder and the other sheet being normally maintained in close intimate contact, and means to separate the shoulder and the other sheet under resilient deforming pressure whereby to open the conduit, the means to separate maintaining the shoulder and the other sheet apart under resilient deforming pressure while the conduit is open.

4,798,325

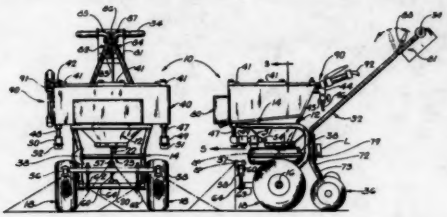
METHOD AND APPARATUS FOR APPLYING LIQUID AND DRY LAWN TREATMENT MATERIALS

Robert E. Block, Prarieview, Ill., assignor to Robert F. Parmley, Lindenhurst and Marino D. Floreani, Park Ridge, both of, Ill.

Filed Apr. 20, 1987, Ser. No. 40,298

Int. Cl.[4] A01C *15/00, 19/04*; B05B *1/20*

U.S. Cl. 239—663 **7 Claims**



1. A self-contained, manually propelled apparatus for applying wet and dry lawn treatment materials comprising: hopper means for containing a load of dry treatment material, frame means undersupported on ground engaging wheels for carrying said hopper means in an elevated position and including manually engageable handle means whereby to manually propel the apparatus over the terrain; rotatably driven impeller means mounted beneath said hopper means for receiving dry materials discharged therefrom, means for rotatably driving said impeller means in response to manual propulsion of the apparatus; said impeller means being operable to centrifically broadcast dry materials in a generally horizontal pattern above the level of said wheels; selectively operable means for controlling discharge of dry materials to said impeller means; sealed pressure tank means supported on and extending about the outer periphery of said hopper means for storing liquid and having liquid inlet and outlet means, electrically driven pump means carried by said frame means for pressurizing said liquid and having hydraulic circuit communication with said inlet and outlet means, plural laterally spaced spray nozzles supported on said frame means forwardly of said impeller and wheels and in hydraulic circuit communication with said pump means; said nozzle means being individually operable to spray liquid treatment materials in selected patterns forwardly in advance of the apparatus and beneath the discharge pattern of dry materials broadcast from said impeller means; electrically operated valve means for independently controlling the discharge of liquid from each of said nozzle means, and plural electrical switch means for electively controlling said valve means for individual and simultaneous operation.

4,798,326

MAIL DELIVERY SIGNALING DEVICE

Kenneth R. Kirry, 39 Pleasant St., Apt. 15, Northboro, Mass. 01532, and Joseph V. Visconti, 36 N. Main St., Sherborn, Mass. 01770

Filed Jan. 21, 1988, Ser. No. 146,424

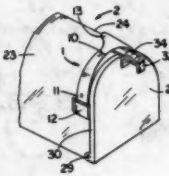
Int. Cl.[4] B65D *91/00*

U.S. Cl. 232—34 **9 Claims**

1. A delivery signaling device for use in conjunction with a standard rural mailbox of the type that is generally tubular in shape, having a bottom wall, two side walls, a curved top wall,

and an open end, and having a pivotally mounted door capable of movement from a closed to an open position for the insertion and retrieval of mail from said box, said door having a flange that overlaps the edges of said walls at said open end when said door is in the closed position, said device comprising a resilient member adapted to resiliently bend in a plane transverse to said mailbox from a signal position, in which said member stands upright, to a set position, in which said member is bent into a curved shape conforming to the curved top wall of said box, and

further comprising a clip member to which the lower end of said resilient member is attached, said clip member being inherently resilient and comprising an outer member, to which said resilient member is attached and which is adapted to remain on the outside surface of said box, and an inner member joined to said outer member at a bend region, said inner and outer members and bend region shaped and positioned to permit said clip member to be



slid onto a side wall of said box with said inner and outer members providing a gripping force on said side wall to retain said clip member on said box, and

wherein said resilient member has a display region at its free end, said display region being sized and positioned so as to be visible to the user from a distance, thereby to provide an indication that mail has been delivered to said box, and

wherein said resilient member has a tab portion extending from its free end in the direction of said door and a downwardly directed portion adapted to extend over an edge of one of said walls when said resilient member is in said set position, said tab portion being shaped and positioned so as to be confined between said door and the edge of said wall so long as said door remains closed, and so as to be released from confinement when said door is moved to said open position, and

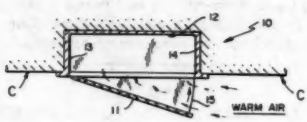
wherein said resilient member is a sheet material with its thin dimension generally normal to said walls of said box.

4,798,327

CONVECTION LOCK-VENT

George R. Arnold, 5 Hope Dr., Sutherland, Va. 24594

Filed Jan. 29, 1985, Ser. No. 696,033
Int. Cl.[4] F24D *5/00*
U.S. Cl. 237—50 4 Claims



1. A device for the redistribution of warm air across levels of a building having a higher level and a lower level comprising:

(1) a warm air collecting means located in a warm portion of a buliding, said warm portion being located in the lower levels of said building;

(2) conduit means connected to said warm air connecting means and extending into a cool portion of the building said cool portion being located in the higher portion of said building;

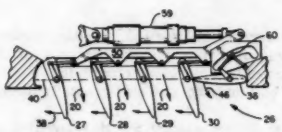
wherein said warm air collecting means comprises a ceiling portion which is located within the ceiling of the warm portion of the building and a protruding portion which is connected to the ceiling portion and which extends downwardly from the ceiling of the warm portion of the building, said protruding portion having an opening for the entrance of warm air from the warm portion of the building into the warm air collecting means, said opening oriented toward a heat source within the warm portion of the building and wherein said warm air is moved through said warm air collecting means and said conduit means by convection current, and wherein the protruding portion of said warm air collecting means is pivotably connected to the ceiling portion of said warm air connecting means so that the protruding portion of the warm air collection means may be rotated upwardly into the ceiling portion of the warm air collecting means, thereby disabling the device.

4,798,328

AREA CONTROLLED, THRUST VECTORING VANE CASCADE WITH NUTATING CONTROL VANE

Edward B. Thayer, Jupiter; Philip R. Scott, Lake Park, both of Fla., and Thomas A. Roach, Mauldin, S.C., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 22, 1987, Ser. No. 53,282
Int. Cl.[4] B64C *15/02*
U.S. Cl. 239—1 3 Claims



1. An exhaust gas thrust vectoring vane cascade having a plurality of individual cascade vanes pivotable in unison about a corresponding plurality of parallel pivot axes, the cascade vanes being pivotable over a thrust vectoring range of motion, including

a first forward thrust position, wherein the cascade vanes are pitched for discharging the exhaust gas rearwardly,

a second, lateral thrust position, wherein the cascade discharges the exhaust gas normally with respect to the cascade, and

a third, rearward thrust position, wherein the cascade vanes are pitched for discharging the exhaust gas forwardly;

the cascade vanes further being pivotable over an adjacent stowing range of motion defined between the first forward thrust position and a stowed position wherein each vane in the cascade contacts each adjacent vane thereto in an overlapping relationship, the stowed adjacent vanes collectively blocking off the cascade gas flow;

means for providing a constant collective gas flow area through the vane cascade over the thrust vectoring range of motion, comprising:

a first flow regulating vane disposed adjacent one end vane of the plurality of cascade vanes and pivotable about an axis parallel to the pivot axes thereof,

means for pivoting the first flow regulating vane responsive to the pivoting of the cascade vanes, wherein,

the first flow regulating vane pivots counter-rotationally with respect to the cascade vanes over the thrust vectoring range of motion, such that

the first flow regulating vane is oriented chordally parallel to the one end vane when the cascade vanes are in the first and third thrust vectoring positions, and the first flow regulating vane is oriented substantially perpendicular to the one end vane when the cascade vanes are in the second, lateral thrust position, and

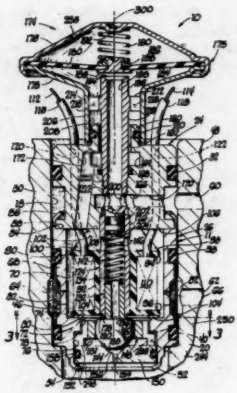
wherein the first flow regulating vane pivots co-directionally with the cascade vanes over the stowing range of motion between the first and stowed positions, such that the first flow regulating vane achieves an overlapping relationship with the adjacent one end vane when the cascade vanes are in the stowed position.

4,798,329

COMBINED FUEL INJECTOR AND PRESSURE REGULATOR ASSEMBLY

Gerhard Mesenich, Bochum, Fed. Rep. of Germany, assignor to Colt Industries Inc., New York, N.Y.

Filed Mar. 3, 1987, Ser. No. 21,231
Int. Cl.[4] B05B *1/30, 1/14;* C11D *9/18;* F16K *15/00*
U.S. Cl. 239—5 **18 Claims**



18. A duty-cycle type electromagnetic injector assembly, comprising a housing, a valve having an electrical coil therein, and cooperating valve seat within said housing, said valve being positioned away from or against the valve seat depending upon whether said electrical coil is energized, and a fluid pressure regulator forming a portion of said injector assembly in a manner to enable establishment, by separate adjustments of said pressure regulator with respect to said housing, the static and the dynamic rates of liquid flow metered by said injector assembly.

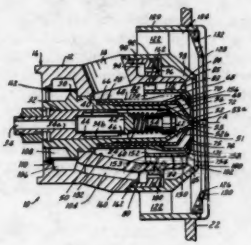
4,798,330

REDUCED COKING OF FUEL NOZZLES

Alfred A. Mancini, Farmington Hills; James W. Sager, Union Lake, and Theodore R. Koblish, Birmingham, all of Mich., assignors to Fuel Systems Textron Inc., Zeeland, Mich.

Filed Feb. 14, 1986, Ser. No. 829,269
Int. Cl.[4] F23D *11/00*
U.S. Cl. 239—8 **18 Claims**

1. In a fuel nozzle useful for a gas turbine engine and having a nozzle face, the combination of fuel supply means on the nozzle, said fuel supply means including an annular fuel discharge body converging in a downstream direction toward a longitudinal central axis of the nozzle and terminating in a downstream fuel discharge orifice substantially on the central axis for discharging fuel from the orifice for mixing with air downstream of the nozzle face, air supply means on the nozzle for discharging air from the nozzle face, and means on the nozzle around the fuel discharge body cooperating with the air supply means for controllably discharging sufficient air flow with locally reduced swirl strength over the fuel discharge body to establish a recirculation zone spaced away from the



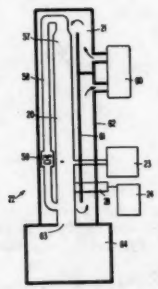
nozzle face downstream thereof a sufficient distance to substantially reduce coking on the nozzle face.

4,798,331

ARTIFICIAL SNOW PRODUCTION APPARATUS

Nagaichi Suga, Tokyo, Japan, assignor to Suga Test Instruments Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,716
Claims priority, application Japan, Dec. 24, 1986, 61-310436
Int. Cl.[4] A01H *15/00*
U.S. Cl. 239—14.2 **3 Claims**



1. In an artificial snow generating apparatus having a vertical inner cylinder for generating and growing snow and an outer tank surrounding the inner cylinder and including means for cooling the air in the outer tank for thereby cooling said inner cylinder, the improvement comprising:

an ice crystal quantitative feeder for generating and feeding a predetermined quantity of ice to a lower part of the inner cylinder and having a cooled spray chamber connected to said inner cylinder, a spray producing nozzle means in said spray chamber, a feed water tank connected to said spray producing nozzle means, a saturation tank containing water connected to said spray producing nozzle means, a compressed air means connected to said saturation tank for directing compressed air through the water in said saturation tank and into said spray chamber through said nozzle means to produce a spray of water into said spray chamber from said feed water tank, and means for periodically blowing humidified air through said spray chamber to blow ice particles into the inner cylinder; and

a cloud-forming water quantitative feeder for generating and feeding a predetermined quantity of particles of cloud-forming water having a predetermined particle size to the inner cylinder at a position above said ice crystal quantitative feeder and having a particle classification pipe connected to said inner cylinder, a further spray producing

nozzle means in said particle classification, a further feed water tank connected to said particle classification pipe, a further saturation tank containing water connected to said further spray producing nozzle means, a further compressed air means connected to said further saturation tank for directing compressed air through the water in said further saturation tank and into said classification pipe through said further nozzle means to produce a spray of water particles into said classification pipe from said further feed water tank, said particle classification pipe including means for separating particles larger than a predetermined size from the spray of water particles and for passing the remainder of the water particles into the inner cylinder.

4,798,332

LIQUID ATOMIZER

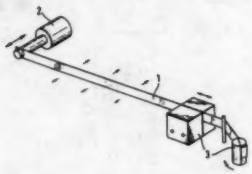
Ernst-Günter Lierke, Schwalbach; Rudolf Grossbach, Camberg; Wolfgang Heide, Darmstadt; Karl Fliigel, Todtnau, and Martin Junger, Grafenberg, all of Fed. Rep. of Germany, assignors to Battelle-Institut E.V., Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 2,652, filed as PCT EP86/00307 on May 21, 1986, published as WO86/06985 on Dec. 4, 1986, abandoned. This application May 2, 1988, Ser. No. 191,773

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518646

Int. Cl.[4] B05B 3/14

U.S. Cl. 239—102.2 **18 Claims**



1. Liquid atomiser comprising a narrow linear bending strip (1) on which bending waves with several essentially parallel, closely spaced nodal lines can be generated, means to deliver a liquid to be atomised along the linear dimension of said narrow linear bending strip, excitation means (2) at one end of said narrow linear bending strip to impart an ultrasonic excitation thereto, and at least one mechanical fixing means (3) at the other end of said narrow linear bending strip to support said narrow bending strip, said narrow linear bending strip (1) having a comparatively small thickness such that it does not have sufficient inherent dimensional stability for linear alignment when in a horizontal plane said dimensional stability of the narrow bending strip being achieved by said at least one mechanical fixing means (3).

4,798,333

PORTABLE SPRAYER WITH IMPROVED COMBINATION OF PISTON AND DIAPHRAGM PUMP

Pedro W. Luchsinger, Panamericana 445, Lagos de Moreno, C.P. 47400, Jalisco, Mexico

Continuation-in-part of Ser. No. 845,631, Mar. 28, 1986, Pat. No. 4,768,714, which is a continuation-in-part of Ser. No. 616,012, May 31, 1984, abandoned. This application Jul. 24, 1987, Ser. No. 77,352

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.[4] B05B 9/43

U.S. Cl. 239—142 **20 Claims**

1. A liquid dispensing sprayer and liquid agitator for spraying insecticides, herbicides and the like including suspensions of wettable powders, comprising:

a container adapted to be carried on the back of a person,

a pressure vessel mounted within said container, and dual pump means connected to the container and pressure vessel for pumping liquid from said container into said pressure vessel and for agitating contents of said container, said pump means comprising:

a piston housing section,

a diaphragm housing section connected to one end of said piston housing section,

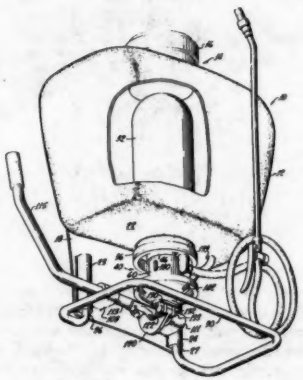
a housing cover connected and sealed to said diaphragm housing section and cooperating therewith to partly define an operating pump chamber,

a diaphragm extending across said pump chamber and having a peripheral edge captured and sealed between said cover and diaphragm housing section, said diaphragm cooperating with said diaphragm housing section to define an agitator pump chamber, and

a piston assembly secured to said diaphragm and slidably mounted within said piston housing section, said piston assembly comprising:

a piston body having a closed end,

a skirt retainer fixed to said piston body and having an outer annular surface,



a sealing skirt mounted on said outer surface of said skirt retainer, and

resilient means interposed between said sealing skirt and said skirt retainer for urging said skirt radially outwardly of said retainer,

valve means for connecting the interior of said piston housing section with the interior of said pressure vessel and with the interior of said container,

a discharge tube connected with the pressure vessel for spraying liquid under pressure,

an agitator conduit having a nozzle end in fluid communication with the interior of said container and having a pump end in fluid communication with said agitator pump chamber, and

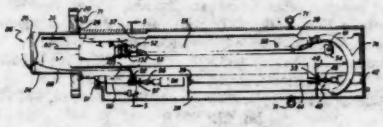
means for concomitantly driving said piston assembly and diaphragm, whereby liquid under pressure is pumped from the container into the pressure vessel by the piston assembly, and the diaphragm draws liquid from the container into the agitator pump chamber and projects liquid from the agitator pump chamber back into the container in a high velocity stream.

4,798,334

APPARATUS FOR SPRAYING A LIQUID IN A VESSEL

Max G. Harrington, Citrus Heights, Calif., assignor to New West Engineering, Ltd., Citrus Heights, Calif.

Filed Sep. 25, 1987, Ser. No. 100,827
Int. Cl.[4] B05B 13/06, 3/18
U.S. Cl. 239—227 8 Claims



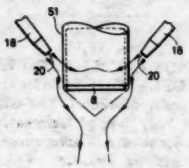
1. An apparatus for directing a liquid spray against the interior walls of a vessel from a nozzle spray means comprising:
(a) a housing mounted externally on said vessel:
(b) a carrier assembly slidably mounted within said housing;
(c) a nozzle support assembly slidably mounted to said carrier assembly;
(d) door means on said housing for sealing said housing from the interior of said vessel and allowing entry of said carrier assembly into said vessel;
(e) nozzle spray means mounted on the end of said nozzle support assembly;
(f) a fluid delivery system passing within said housing terminated at said nozzle;
(g) means for extending said carrier assembly and said nozzle support assembly with said vessel at different rates using a single power drive means.

4,798,335

ROTATING SPRAYING TYPE COATING APPARATUS

Kazuyuki Tachi; Chikaaki Okuda; Katsunori Yamada; Yoichi Oyama, and Shoichi Suzuki, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Sep. 16, 1987, Ser. No. 97,651
Claims priority, application Japan, Sep. 16, 1986, 61-218914
Int. Cl.[4] B05B 1/28, 3/10
U.S. Cl. 239—296 7 Claims



1. A rotating spraying type coating apparatus, comprising:
a rotating drive device having a rotating shaft,
a spraying head attached to the rotating shaft of said rotating drive device, said spraying head having a proximal end on the side of said rotating shaft and a distal end on the side of an article to be coated,
a paint supply passage connected to said spraying head,
a paint radiating portion for radiating paint particles formed at the distal end of said spraying head,
at least one partition member disposed outside said spraying head, and
air jetting means comprising at least one pair of air outlet ports spaced from and provided outside said at least one partition member, prolongations of central axes of said at least one pair of air outlet ports intersecting an outer peripheral surface of said at least one partition member at a predetermined angle, for jetting air towards the outer peripheral surface of said at least one partition member and for forming air streams spreading in the circumferential direction along the outer peripheral surfaces of said at least one partition member and said spraying head, wherein said air streams from each of said at least one pair of air outlet ports collide with each other at substantially intermediate points on the outer peripheral surface of the spraying head, said air streams having a circumferential velocity component in addition to an axial velocity component such that paint particles radiated centrifugally from said spraying head are prevented from being diffused centrifugally and the spray pattern of said paint from said spraying head is of an eliptical or dumbbell shape.

4,798,336

CONTROL MEANS FOR SPRAYING APPARATUS

Jan Ilott, 24 Montague Hill, Kingsdown, Bristol, United Kingdom

PCT No. PCT/GB85/00186, § 371 Date Nov. 26, 1986, § 102(e) Date Nov. 26, 1986, PCT Pub. No. WO86/05718, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 27, 1986, Ser. No. 948,356
Claims priority, application United Kingdom, Mar. 27, 1985, 8507996
Int. Cl.[4] B05B 7/24, 7/06
U.S. Cl. 239—337 16 Claims

1. In a gas-operated spraying apparatus having a body, a nozzle mounted at a forward end of said body, a needle located coaxially of said nozzle, said needle being retractable in said nozzle to dispense media to be sprayed, medium feed means and propellant feed means, an operating member, and control means manipulated by said operating member for controlling the retraction of said needle and hence of the dispensation of the medium to be sprayed, the improvement wherein said control means comprises:- coupling means supporting said operating member, said coupling means comprising a first support member wherefrom said operating member is pivotally suspended at a first location, and a second movable, support member, said second support member serving, on movement in a first direction, to effect retraction of said needle, said operating member being pivotally suspended from said second support member at a second location spaced from said first location, whereby said operating member is in suspension between said first and second support members, said suspension permitting both arcuate movement of said operating member to move said second support member in said first direction to retract said needle, and linear movement of said operating member perpendicular to the axis of said needle, in which movement of said second support member is minimized.

4,798,337

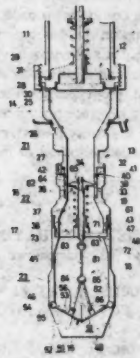
LIQUID FILLING NOZZLE

Masao Shimokawa, Tokushima, Japan, assignor to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed Jul. 20, 1987, Ser. No. 75,468
Claims priority, application Japan, Jan. 23, 1987, 62-14845
Int. Cl.[4] B05B 1/32; F16K 31/12
U.S. Cl. 239—570 5 Claims

1. A liquid filling nozzle comprising:
a vertical tubular nozzle main body having a first large diameter portion, an intermediate portion, a reduced diameter portion and a second large diameter portion, said portions being directly connected in the above order, the second large diameter portion having a lower end to discharge liquid therefrom, and the reduced diameter portion being substantially shorter than the total length of the other portions;
a damper pivotally attached at the lower end of the nozzle main body to open and close the lower end;
a resistant member positioned within the reduced diameter portion of the nozzle main body being movable upward

and downward for acting against liquid flowing downward;



a member connecting the damper to the resistant member; and

a resilient member urging the resistant member upward.

4,798,338

APPARATUS FOR THE ELECTRO-KINETIC CHARGING OF POWDERED MATERIALS

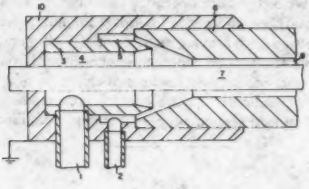
Helmut Bauch; Wolfgang Kleber, and Dieter Auerbach, all of Dresden, German Democratic Rep., assignors to VEB Infrarot-Anlagen Oranienburg, Oranienburg, German Democratic Rep.

Continuation of Ser. No. 691,805, Jan. 15, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 939,257

Claims priority, application German Democratic Rep., Feb. 8, 1984, 2599262

Int. Cl.[4] B05B 5/00

U.S. Cl. 239—692 **6 Claims**



1. Apparatus for the electro-kinetic charging of a powder, which comprises a housing, a first input channel for the introduction of the powder dispersed in a gas flow, a second input channel for the introduction of another gas flow, a central rod of an insulating material extending throughout the length of the apparatus, a semiconducting annular electrode having anti-sticking properties for generating passive electrostatic ionization and having a conical edge-shaped end and an inner and an outer surface and being connected from ground potential, said semiconductive annular electrode being disposed about said central rod and defining a first annular chamber between the inner surface of said semiconductive annular electrode and said central rod, the first input channel terminating in said first annular chamber, said housing and the outer surface of said semiconductive annular electrode defining a second annular chamber therebetween, said second input channel terminating in said second annular chamber, said first and second annular chambers merging with each other past the edge-shaped end of said semiconductive annular electrode, a pipe of an insulating material disposed concentrically about said central rod, and defining an annular flow channel between the central rod and said pipe, one end of said annular flow channel being disposed adjoining the terminations of said first and second annular chambers.

4,798,339

SUBMERGED JET INJECTION NOZZLE

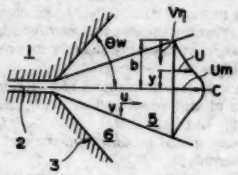
Kenji Sugino, Uozu; Katsuya Yanaida, Shiga; Hiroshi Sugino, Nishinomiya; Masao Nakaya, Kurobe; Nobuo Nishida, and Kensaku Eda, both of Toyama, all of Japan, assignors to Sugino Machine Limited, Toyama, Japan

Continuation of Ser. No. 695,897, Jan. 29, 1985, abandoned. This application Oct. 22, 1986, Ser. No. 921,969

Claims priority, application Japan, Feb. 13, 1984, 59-25681

Int. Cl.[4] B05B 1/02

U.S. Cl. 239—601 **3 Claims**



1. A liquid jet injection nozzle for positive production of cavitation when submerged in a liquid, said nozzle consisting essentially of:

(a) an orifice section having a tubular bore of uniform cross-sectional area in communication with a pressurized liquid supply means producing a high velocity jet stream of liquid from said liquid supply means; and

(b) a divergent nozzle exit section extending from the downstream end of said orifice section, said exit section having a length in the range of 5 to 12 times the diameter of the bore of the tubular orifice section and an inlet diameter equal to the diameter of said tubular bore and increasing in diameter along its axis at an angle with respect to the axis thereof in the range of 20 to 60 degrees.

4,798,340

ELECTROSTATIC DEVICE FOR POWDER SPRAYING WITH TRIBOELECTRIC POWDER CHARGING

Gerhard F. Vöhringer, Markdorf, and Kurt Pfeifer, Salem-Beuren, both of Fed. Rep. of Germany, assignors to ESB Elektrostatische Sprüh- und Beschichtungsanlagen G.F. Vohringer GmbH, Meersburg, Fed. Rep. of Germany

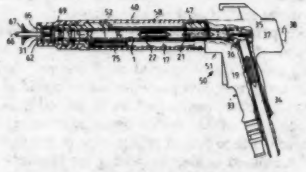
PCT No. PCT/DE87/00004, § 371 Date Sep. 11, 1987, § 102(e) Date Sep. 11, 1987, PCT Pub. No. WO87/04088, PCT Pub. Date Jul. 16, 1987

PCT Filed Jan. 9, 1987, Ser. No. 112,840

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, 3600808

Int. Cl.[4] B05B 5/02

U.S. Cl. 239—692 **24 Claims**



1. Electrostatic device for spraying powder particles with

triboelectric charging by means of a powder pipe surrounding a delivery channel which constitutes part of a flow channel for the spray powder and of at least one displacement body mounted in the flow channel in order to increase the flow velocity, whereby the powder pipe is grounded on its outside and provided at least on its inside with a triboelectric material which is arranged at a distance from the powder particles to be sprayed, the improvement comprising an aftercharging device for the triboelectrically charged powder particles having the same polarity as that polarity induced during the electrostatic charging, and the aftercharging device also has aftercharger electrodes arranged inside the powder pipe.

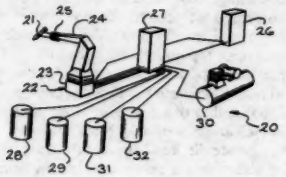
23. Electrostatic device for spraying powder particles with triboelectric charging by means of a powder pipe surrounding a delivery channel which constitutes part of a flow channel for the spray powder and a plurality of displacement bodies mounted in the flow channel in order to increase the flow velocity, whereby the powder pipe is grounded on its outside and provided at least on its inside with a triboelectric material which is arranged at a distance from the powder particles to be sprayed, characterized by an aftercharging device for the triboelectrically charged powder particles having the same polarity as that polarity induced during the electrostatic charging, and wherein several of said displacement bodies being fixedly arranged one after another in a powder flow direction each have a plurality of axial guide ribs which lie in staggered rotation from one another about a flow axis of the powder pipe and so that none of the guide ribs are in axial alignment with another guide rib.

4,798,341

SPRAY GUN FOR ROBOT MOUNTING

James J. Gimple, Oregon, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio

Filed Sep. 28, 1987, Ser. No. 101,881
Int. Cl.[4] B05B 5/08, 5/02
U.S. Cl. 239—694 **6 Claims**



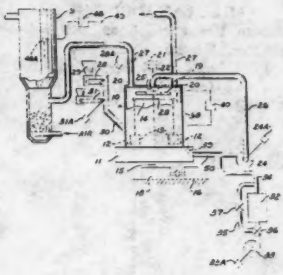
1. A spray gun for mounting on a robot, said spray gun comprising a housing having first and second ends, means for attaching said first housing end to such robot, a valve manifold attached to said second housing end, said housing defining a passage for fluid conduits between said first and second housing ends, said valve manifold having a first surface outside said housing and a second surface opening into said housing, a spray head including a trigger valve and means for discharging on atomized liquid in response to the application of pilot air to said trigger valve, said spray head having a body removably attached to said first manifold surface, said manifold defining separate passage means between said first and second manifold surfaces for supplying liquid, atomization air, pattern shaping air and pilot air to said spray gun, normally closed first valve means located in said atomization air passage means responsive to pilot air for supplying atomization air to said spray head, normally closed second valve means located in said pattern shaping air passage means responsive to pilot air for supplying pattern shaping air to said spray head, and normally closed actuating valve means in said spray gun responsive to an electric signal for supplying pilot air simultaneously to said first and second valve means and for supplying pilot air to said trigger valve.

4,798,342

FUEL PROCESSING SYSTEM FOR CONTROL OF NITROUS OXIDE EMISSIONS

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Jan. 11, 1988, Ser. No. 141,831
Int. Cl.[4] B02C 23/34
U.S. Cl. 241—18 **12 Claims**



1. In a system for processing cola in a roller mill grinding zone to pulverize the coal as a fuel for use in a burner, and for controlling the emission of nitrous oxide on combustion of processed coal, the improvement comprising:

(a) means supplying coal to the roller mill for pulverizing the coal therein;

(b) means for supplying air into the roller mill for sizing and moving the pulverized coal; and

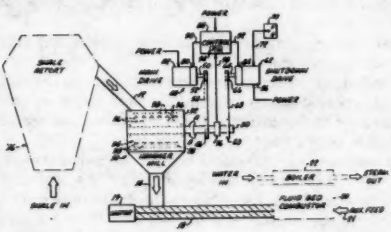
(c) means in the coal processing system for transporting the pulverized coal to the burner and simultaneously decoupling a portion of the air moving the pulverized coal, whereby the air-to-coal ratio going to the burner is substantially correct for limiting the nitrous oxide emission.

4,798,343

LOW SPEED SHUT DOWN APPARATUS AND METHOD FOR HIGH TEMPERATURE HAMMER MILLS

Mitchell J. Berndt, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 30, 1987, Ser. No. 102,861
Int. Cl.[4] B02C 25/00
U.S. Cl. 241—36 **13 Claims**



1. In a high temperature hammer mill having high speed drive means connected to a drive shaft so as to cause said shaft to rotate at a relatively high speed, a low speed shutdown apparatus comprising:

a. shutdown drive means for providing a low drive shaft rotational speed relative to the speed at which the hammer mill drive shaft is driven by the high speed drive means at normal operating conditions, at a high torque relative to the torque provided to the drive shaft by the high speed drive means at normal operating conditions; and

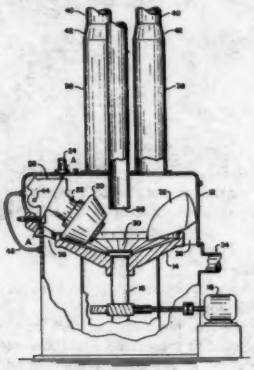
b. operating means for disengaging said high speed drive means from said shaft and for engaging said shutdown drive means with said shaft so as to enable said shaft to be turned at said relatively low speed.

4,798,344

MILL EXHAUST SYSTEM

John D. Fishburn, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 4, 1984, Ser. No. 617,000
Int. Cl.[4] B02L *23/32*
U.S. Cl. 241—79.1 3 Claims



1. A pulverizing mill for pulverizing material and for delivering the pulverized material to a process through a transport line comprising:

a housing;

a rotatable bowl within the housing, said bowl having an upper surface;

means for rotating the bowl;

means for depositing material to be pulverized on the upper surface of the bowl;

a grinding roll supported within the housing cooperating with the upper surface of the bowl to perform pulverizing therebetween;

means for supplying air to the housing for entraining pulverized material therein; and

a vertical gravity separator means for classifying the pulverized material and for returning the more coarse pulverized material to the surface of the bowl, the vertical separator means comprising:

a substantially cylindrical conduit extending upwardly from the top of the housing defining a flow passage duct for conducting the pulverized material entrained in air from the housing, the passage duct having a greater cross-sectional area than the transport line and being of a length and cross-sectional area relative to the airflow therethrough to classify the pulverized material entrained in the airflow, the length to diameter ratio of the conduit being at least 5 to 1, and

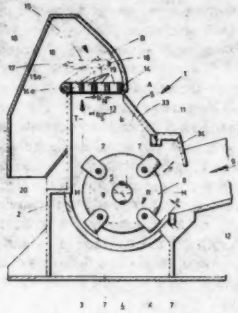
a reduced section between the conduit and the transport line having an inlet and an outlet, the inlet having the same cross-sectional area as the conduit and the outlet having the same cross-sectional area as the transport line, whereby the finer pulverized particles entrained in the airflow entering the conduit pass into the transport line thence to the process.

4,798,345

HAMMER BREAKER

Manfred Adolph, Langenfeld, Fed. Rep. of Germany, assignor to Lindermann Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 815,754, Dec. 31, 1985, abandoned, which is a continuation of Ser. No. 531,813, Sep. 13, 1983, abandoned. This application Sep. 21, 1987, Ser. No. 99,666
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1982, 3234298
Int. Cl.[4] B02C *13/286*
U.S. Cl. 241—186.2 8 Claims



1. In a hammer breaker for breaking and crushing scrap material, such as metal scrap, to different lump sizes, said hammer breaker comprising a housing, a hammer rotor mounted within said housing for rotation about a horizontal axis, said rotor having a plurality of hammers pivotally mounted thereon rotating in a hammer impact circle, an inlet to said housing for the material to be broken and crushed, an upwardly extending shaft defined by said housing aligned above said rotor and adapted to receive broken and crushed material thrown tangentially upwardly from said rotor, said shaft having an open top end defining a material outlet spaced upwardly from said hammers, and a material classifying grate covering said outlet, wherein the improvement comprises that said shaft has a plurality of sides defining an open space which is free of obstacles between said rotor and said outlet, said hammer rotor rotates in one direction only past said shaft, anvils located within said housing adjacent the hammer impact circle and located downstream from said shaft relative to the movement of said hammers along the hammer impact circle, said housing forming a discharge passageway located along and extending from said classifying grate to a discharge opening for discharging the scrap material out of said hammer breaker after it passes through said classifying grate, said classifying grate is adjustably pivotally mounted relative to said shaft about a pivot axis extending transversely of the upward direction of said shaft and located along one side of said shaft spaced upwardly from the hammer impact circle, said grate is spaced upwardly a distance from the hammer impact circle considerably greater than the distance between the hammer impact circle and said anvils, drive means is provided for adjusting said grate about the pivot axis, said classifying grate having invariable grate openings therethrough for the passage of the broken and crushed scrap material from said shaft to said passageway and discharge opening, and said classifying grate being pivotally movable about said pivot axis as a unit along another side of said shaft opposite said pivot axis between a first position where the maximum area of said grate openings is presented to said shaft and a plurality of second positions spaced angularly from the first position where as the angular displacement from the first position increases the area of said grate openings presented to said shaft decreases, and in and between said first and all of said second positions said classify-

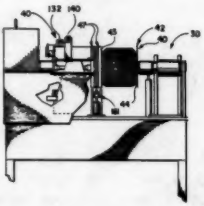
ing grate extends to said another side and substantially covers said material outlet so that the broken and crushed material is discharged only through said grate openings, said drive means also selectively setting said grate in said first and said plurality of second positions.

4,798,346

METHOD OF AND APPARATUS FOR TAKING UP LIGHTGUIDE FIBER

Daryl L. Myers, Lawrenceville, and James G. Wright, Jr., Roswell, both of Ga., assignors to American Telephone and Telegraph Company - AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 5, 1986, Ser. No. 938,657
Int. Cl.[4] B65H *67/056*
U.S. Cl. 242—18 A **27 Claims**



1. A strand winding apparatus in which strand such as optical fiber is wound, said apparatus comprising:

rotatably drive take-up means; and

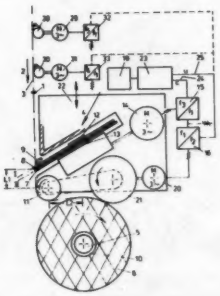
a strand storage and clamping assembly mounted rotatably coaxially of and closely adjacent to the take-up means and comprising portions moveable relative to each other for receiving therebetween coils of an end portion of strand material to be wound on the take-up means adapted to store and protect from damage the coiled end portion of the strand and to clamp the coils laterally of planes of the coils with forces which are applied parallel to the axis of the coils.

4,798,347

METHOD FOR WINDING FILAMENT YARNS

Heinz Schippers, and Siegmar Gerhartz, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,849
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 3627879; Oct. 24, 1986, 3636151
Int. Cl.[4] B65H *54/02, 54/28, 54/38*
U.S. Cl. 242—18 R **14 Claims**



1. In a method of winding a textile yarn onto a supporting core to produce a finished yarn package having a total yarn thickness, and which comprises the steps of winding the yarn about the core at a substantially constant rate and such that the rotational speed of the package gradually decreases, while guiding the yarn onto the core by a traversing yarn guide, the improvement therein comprising the steps of

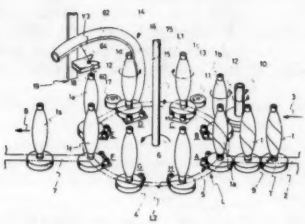
winding an initial portion of the total yarn thickness while maintaining the traversing speed at a value having no fixed relationship with the spindle speed and so as to produce a random wind, and then winding a subsequent portion of the total yarn thickness while decreasing the speed of the traversing yarn guide in proportion to the decreasing rotational speed of the package to define a substantially constant winding ratio during each of a series of sequential steps of the winding cycle, rapidly increasing the speed of the yarn traversing guide at the end of each sequential step to produce a stepped precision wind and so as to define upper and lower limits of the yarn traversing speed during each sequential step.

4,798,348

YARN END FINDING DEVICE

Isamu Matsui, Kyoto, and Noboru Sekitani, Ohtsu, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 19, 1986, Ser. No. 909,495
Claims priority, application Japan, Sep. 24, 1985, 60-210593
Int. Cl.[4] B65H *54/00*
U.S. Cl. 242—35.6 E **12 Claims**



1. A yarn end finding device for finding a yarn end on a yarn layer wound on a spinning bobbin comprising:

a bobbin processing station having means for separating said yarn end from said yarn layer wound on said spinning bobbin,

a bobbin rotating and driving device for rotating said spinning bobbin in a first direction of rotation relative to said bobbin processing station and in a second direction of rotation relative to said bobbin processing station, and

a discriminating device for discriminating the winding direction of said yarn layer wound on said spinning bobbin,

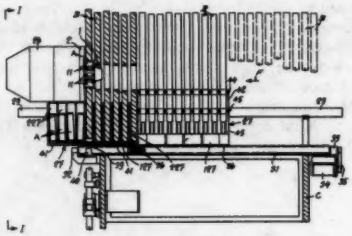
control means for controlling said bobbin rotating and driving device in response to said discriminating device so that the rotating direction of said spinning bobbin relative to said bobbin processing station is controlled according to the winding direction of said yarn layer wound on said spinning bobbin.

4,798,349

AUTOMATIC DEVICE FOR FEEDING BOBBINS OF A WRAPPING MATERIAL WEB, PARTICULARLY BOBBINS OF CIGARETTE PAPER

Renato Manservisi, Bologna, Italy, assignor to SASIB S.p.A., Italy

Filed Oct. 6, 1987, Ser. No. 104,951
Claims priority, application Italy, Nov. 14, 1986, 12580 A/86
Int. Cl.[4] B65H *19/12, 19/18*
U.S. Cl. 242—58.1 17 Claims



1. An apparatus for feeding bobbins, each having a tubular core and a web of wrapping material thereon, to a mandrel having a substantially horizontal axis, comprising:

advancing means for advancing the bobbins, one after another and one step at a time, in the axial direction of the mandrel, said avvancing means comprising an intermittently slidable bobbin carrying cradle, said cradle having a plurality of lower peripheral surfaces, each surface adapted to receive a bobbin resting thereon in a position with its bobbin axis generally parallel to the axis of the mandrel and generally axially aligned with the mandrel,

the mandrel having a plurality of radially extendable and retractable jaws spaced about its periphery, such that in the radially retracted position the jaws loosely and freely receive a bobbin core, and in the radially extended position the jaws tightly engage the inside of the core of a bobbin, the mandrel and its jaws being positioned, relative to the advancing means, such that as the advancing means advances the bobbins one step, the leading bobbin is received on the mandrel, about the jaws, while the jaws are in their retracted position,

the axis of the mandrel being located eccentrically upwards relative to the axis of a bobbin resting on its lower peripheral surface, with respect to a bobbin having the maximum allowable outside diameter permitted by the said cradle,

whereby, the eccentricity of the mandrel, the outside diameter of the jaws in the retracted position and the inside diameter of the bobbin cores are so selected, for a bobbin of appropriate outside diameter for use with the apparatus, that as a bobbin is moved onto the mandrel and its retracted jaws, and the jaws are radially extended to tightly engage the bobbin case, the bobbin is trued, that is, its axis is made coaxial with the mandrel axis, and the bobbin is raised above its lower peripheral surface.

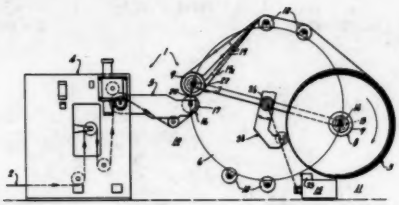
4,798,350

WEB REWIND APPARATUS WITH CUTLESS WEB TRANSFER

Allen R. Jorgensen, Abrams; Larry P. Belongia, Oconto; Kenneth A. Gordon, Sobieski, and John L. La Haye, Green Bay, all of Wis., assignors to Magna-Graphics Corporation, Oconto Falls, Wis.

Filed May 29, 1987, Ser. No. 55,697
Int. Cl.[4] B65H *18/08*
U.S. Cl. 242—64 12 Claims

5. A web transfer apparatus having a thin flexible web passed through at least one work station and rewound into a processed web roll, a winding station for receiving of said web, comprising a rotating first support means having means adapted to receive the free end of a web at said winding station for winding of the web upon itself into a roll, means to drive said support means for winding of the web into said roll, means to transfer said support means from said winding station with said web being maintained adjacent said winding station, means to locate a second support means at said winding station in operative engagement with the surface of said web, means to independently rotate said second support means, clamp means movable into engagement with the second support means, control means operable to simultaneously drive said second support means relative to said first support means and with said



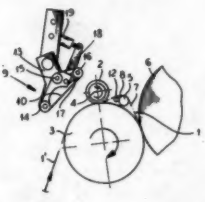
first and second support means rotating at different speeds whereby said web forms a slack loop between said first and second support means, means causing said slack web to move into the nip between said second support means and said clamp means and control means coupled to said first and second support means and including brake means for substantially reducing rotation of said first support means and thereby creating a rapid tension and snap action force on the slack web between said nip of said second support means and said clamp means resulting in a rapid and essentially continuous lateral separation of said web adjacent said clamp means for separation of said web and transfer of said web from said first support means to said second support means along any portion of said web present at the clamp means at the time of transfer.

4,798,351

APPARATUS FOR COILING A FOIL WEB, ESPECIALLY A SYNTHETIC RESIN FOIL WEB

Hartmut Halter, Troisdorf-Eschmar; Paul H. Zimmermann, Lohmar, and Norbert Achterwinter, Hilden, all of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 94,229
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1986, 3630572
Int. Cl.[4] B65H *19/28, 19/26*
U.S. Cl. 242—65 3 Claims



3. An apparatus for winding a foil web, especially a synthetic resin foil web, on a roll core as a step in the coiling of said foil web into a foil web coil with the help of a foil web winding machine comprising:

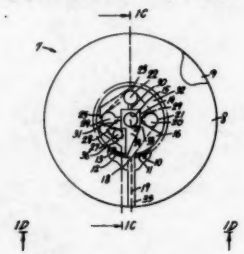
a contacting foil;
a roll core receiver;
a cross cutter for said foil web, said roll core being positioned in said roll core receiver being placeable on said contacting roll with said foil web intervening and running to a downstream one of said foil web coils and said foil web being cuttable with the aid of said cross cutter between said roll core and said downstream foil web coil, and a leading end piece formed by cutting said foil web with said cross cutter being receivable by said roll core;
pivot means for mounting said foil web press device above said roll core, and;
a foil web press device mounted above said foil core received by said roll core receiver, said foil web press device being engagable on said foil core by a pivot motion and having a press belt travelling along with said press device in said pivot motion, said press belt embracing said roll core on the side of said roll core facing away from said contacting roll and forming a wedge-shaped outlet space for said roll core , said press element having a contact angle between 120° and 180° with respect to said roll core, said press belt being held by at least one guide roller holder and provided with tension by a plurality of guide rollers mounted on said guide roller holder and one of said guide rollers being mounted on a pivotable lever arm of said guide roller holder and on setting said press belt on said roll core said press belt is adjustable to a predetermined contact angle; and
an air blower tube located between said entrance wedge space and said cross cutter below the next following uncut one of said foil webs, the blower air stream from said air blower tube being directed in said wedge-shaped outlet space substantially parallel to the engaging direction of said wedge-shaped outlet space.

4,798,352

FILM REEL HAVING FILM-THREADABLE FILM-RETAINING CORE

Michael Naso, 2512 Leslie Street, Union, N.J. 07083, and Frank Naso, 476 Clark Place, Union, N.J. 07083

Filed Nov. 9, 1987, Ser. No. 118,654
Int. Cl.[4] B65H *75/28, 75/18*
U.S. Cl. 242—74 **23 Claims**



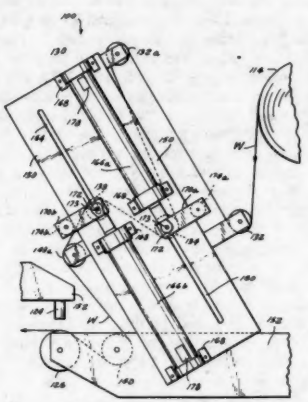
1. In a film reel having an upper face and an opposite-side lower face, in combination having a film-threadable film-retaining core (a) that has an outer collar with an outer collar radially-inwardly positioned wall-surface and with an outer collar radially-outwardly positioned wall-surface, (b) that has an inner collar with an inner collar radially-inwardly positioned wall-surface and with an inner collar radially-outwardly positioned wall-surface, defining a film-threading space between said outside collar's inside wall surface and said inside collar radially-outwardly positioned wall surface, (c) that has a collars's-anchoring floor connecting with at-least a major portion of each of the inner collar radially-outwardly positioned wall-surface and the outer collar radially-inwardly positioned wall-surface, (d) that has a radially extending core-anchoring wall radially-extending between and connecting-together said inner and outer collars, (e) a film-threading slot that extends-radially through said outside collar, and (f) the film-threading space extending from an open slot that extends-radially through said outside collar, the film-threading space extending substantially around said inside collar to terminate at said core-anchoring wall, and (g) said inner collar radially-inwardly positioned wall surface being a spindle-receptacle structure forming a spindle-receiving space of said opposite lower face; the improvement being in said core additionally as a part of said combination comprising: (1) said inner collar radially outwardly-positioned wall-surface including a plurality of wall structures each extending radially outwardly a predetermined distance to end as a wall structure distal-end defining a film-threading gap between said wall structure distal-end and said outer collar's radially-inwardly extending wall-surface; and (2) a film-anchoring post means for reversing direction of threaded film to be wrapped there-around to reverse the film-threading direction, said film-anchoring post means being located within said film-threading space extending upwardly from said collars's-anchoring floor, and said film-anchoring post means being positioned and spaced-away-from each of said core-anchoring wall, the inner collar radially-outwardly positioned wall surface and the radially-inwardly positioned wall surface.

4,798,353

WEB SLITTING SYSTEM AND SLACK INDUCING APPARATUS AND METHOD USEFUL THEREIN

Jack Peugh, Marietta, Ga., assignor to Printpack, Inc., Atlanta, Ga.

Filed Feb. 5, 1987, Ser. No. 10,912
Int. Cl.[4] B65H *23/16*
U.S. Cl. 242—75.3 **22 Claims**



1. Apparatus for inducing a controlled quantity of slack in a web travelling along a travel path from a web supply roll to a web slitter, comprising:
(A) first and second support means movable relative to one another;
(B) first and second sets of rollers secured to said first and second support means, respectively, said first set of rollers remaining at all times to one side of said second set of rollers, said rollers together defining at least a portion of a travel path for the web from a web supply roll to a seb slitter; and
(C) control means responsive to an external signal for moving each of said first and second support means relative to one another a predetermined distance under positive control in such a manner as to effect relative movement of

said first and second sets of rollers, thereby to vary the length of said travel path and induce slack by shortening the length thereof.

4,798,354

FISHING REEL WITH WEAR-RESISTANT LINE GUIDE

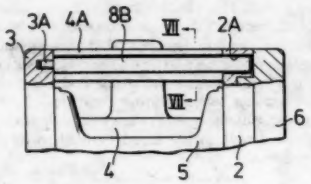
Kazuya Nanbu; Nobuyuki Yamaguchi, and Kaoru Masubuchi, all of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

Filed Dec. 17, 1986, Ser. No. 943,256

Claims priority, application Japan, Dec. 20, 1985, 60-196286[U]; Oct. 29, 1986, 61-166043[U]

Int. Cl.[4] A01K *89/04*

U.S. Cl. 242—84.1 R 4 Claims



1. A double bearing tupe fishing reel comprising a frame body having first and second spaced apart, opposed side frames, a plurality of supports extending between said first and second side frames, said frame body, side frames, and supports being integrally constructed of a synthetic resin, there being a line-carrying spool extending between said side plates for axial rotation, a line provided on said spool for winding and unwinding movement thereabout, at least one of said supports being positioned for normal travel thereacross of said line during winding and unwinding movement, a hard wear-resistant member operatively associated with said at least one support, said wear-resinstant member extending between said first and second side frames, means engaging said wear-resistant member at the opposite ends thereof to said first and second side frames, said wear-resistant member being a rod over which said line travels, said rod extending between said side frames and presenting for exposure to said line between said side frames a constant diameter, said diameter preventing said line when tensioned from coming into contact with said at least one of said supports, the rod being rotatably jornalled at opposite ends in said side frames, the rod thereby protecting the adjacent said at least one of said supports from wear-damaging engagement with said line, the reel including an outer side plate extending externally across one of said side frames, said one of the side frames being apertured by a through-hole for receiving a corresponding first end of the rod, the other end of the rod being received by a blind aperture, the outer side plate extending across and covering the through-hole, whereby the outer side plate keeps the rod from coming out through the through-hole.

4,798,355

FISHING REEL

Kyoichi Kaneko, Tokyo, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan

Filed Mar. 19, 1987, Ser. No. 28,098

Claims priority, application Japan, Apr. 11, 1986, 61-54397[U]

Int. Cl.[4] A01K *89/00*

U.S. Cl. 242—218 3 Claims

1. A fishing reel having oppositely disposed bearings, a handle and a shaft connected to the handle, said reel comprising:

a spool shaft having an engagement portion; a spool fixedly connected to the spool shaft;

left and right side plates of said reel for rotatably supporting the spool shaft;

a pinion detachably fitted to the engagement portion of said spool shaft;

a driving gear disposed on the shaft of the handle and engaged with said pinion;

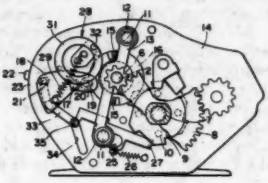
a clutch piece engaged with said pinion;

a spring for biasing said clutch piece to engage said pinion with said engagement portion of said spool shaft;

a clutch cam rotatably disposed around said spool shaft and rotated therearound so as to press said clutch piece in the direction of an axis of said spool shaft and detach said pinion forms aid engagement portion of said spool shaft;

an operation member;

a pivoting plate, pivotally mounted on one of the side plates at a rear end portion thereof and having one side which is



connected to said clutch cam for movement relative thereto and another side which is connected to the operation member;

a tension coil spring connected to said pivoting plate and to said one side plate for bi-directionally biasing and pivotally moving said pivoting plate in pivoting directions which are opposite to one another relative to a dead point of said tension coil spring;

a kick member disposed on said handle shaft;

a kick plate moved by the kick member to engage with and pivotally move said pivoting plate until said pivoting plate passes the dead point of said tension coil spring; and

means for ordinarily retaining said kick plate out of a locus of said kick member, said means retaining said kick plate in the locus of said kick member during a clutch-disengaging period.

4,798,356

FLEXIBLE FRAME FASTENING SYSTEM FOR KITES

Frank Alonso, Pacoima, Calif., assignor to Spectra Star Kites, Pacoima, Calif.

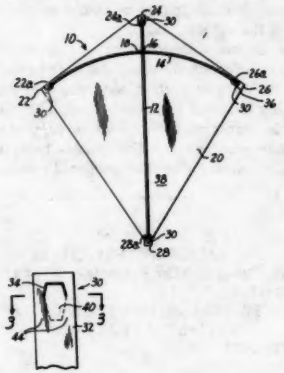
Filed Aug. 17, 1987, Ser. No. 86,263

Int. Cl.[4] B64C *31/06*

U.S. Cl. 244—153 R 11 Claims

1. Low cost, flexible, frame anchoring structure for kites having a sail and a supporting frame of rods arranged for corner connection of their ends to said sail, said anchoring

structure comprising a web secured to said sail and locally cut free to define a flexible pocket between said web and said sail for anchoring of said frame rod ends, said structure web being secured to said sail circumferentially about said flexible pocket.



4,798,357

GOLF BAG FIXING SUPPORTER

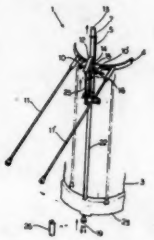
Sung C. Cho, Seoul, Rep. of Korea, assignor to Haldon Industrial Co., Ltd., Yongin, Rep. of Korea

Filed Dec. 21, 1987, Ser. No. 135,846

Claims priority, application Rep. of Korea, Oct. 16, 1987, 17627[U]

Int. Cl.[4] A63B *55/00*

U.S. Cl. 248—96 **1 Claim**



1. A golf bag supporter for installation on a golf bag having an inner cylindrical case and an outer cover, comprising a fixing piece mounted to the cylindrical case between the case and cover; a sliding plate having a cam surface, increasing outwardly in a downward direction slidably mounted to said fixing piece; a fixing collar mounted to said fixing piece on each side of said sliding plate; a rotatable shaft having an inner end and an outer end inserted through each fixing collar; a leg affixed to the outer end of each rotatable shaft; an operating lever affixed to the inner end of each rotatable shaft, each said operating lever having an opening therethrough at a distal end thereof; a sliding shaft inserted through both of said operating lever openings and bridging said cam surface and a cam roller surrounding said sliding shaft in the region bridging said cam surface; an operating bar connected to said sliding plate and having a lower end projecting from the bottom of the golf bag; and a spring means for urging said sliding plate downwardly, whereby placement of the golf bag on the lower end of the operating bar causes upward sliding of said sliding plate against the force of said spring means, and consequent outward pivoting of said legs.

4,798,358

VERTICALLY ADJUSTABLE SWIVEL CHAIR SUPPORTING COLUMN

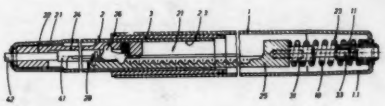
Egon Bräuning, Weil am Rhein, Fed. Rep. of Germany, assignor to Protoned B.V., Netherlands

Continuation of Ser. No. 734,772, May 16, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 73,366

Claims priority, application Switzerland, May 30, 1984, 2677/84

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—161 **3 Claims**



1. A vertically adjustable swivel chair support post having a vertical pipe, the bottom end of which can be secured to the pedestal of a swivel chair; a support pipe telescopically movable with respect to the vertical pipe; a swivel chair seat mounted to the top end of said support pipe; a length adjusting element installed inside said support pipe and vertical pipe, and between their outer ends, the length adjusting element capable of being locked in position with a substantially stationary part supported and centered in the vertical pipe by a spring loaded connecting member and a guide busing; and a sliding part in the support pipe, wherein the improvement comprises:

A. said sliding part being received at its upper end by a guide and mount member fastened to the top end of the support pipe;

B. said support pipe having a central opening at its top end wherein said opening is bordered by a rolled-in rim shoulder and houses a stepped diameter centering projection which extends from said guide and mount member;

C. said guide and mount member being detachably connected to the support pipe by a fastening means which engages said centering projection exterior of said shoulder;

D. said vertical pipe having at its bottom end a base means with a central bore for securing a rotating end portion of said guide bushing of the spring loaded connecting member; and

E. said guide bushing being detachably fastened to the vertical pipe by a connecting means which engages said end portion of the guide bushing exterior of the supporting base.

4,798,359

FURNITURE GLIDE

Richard I. Ball, Round Lake, Ill., assignor to Johnson Industries, Inc., Elgin, Ill.

Filed Jul. 14, 1983, Ser. No. 513,625

Int. Cl.[4] F16M *11/20*

U.S. Cl. 248—188.3 **12 Claims**

1. A self-adjusting furniture support for use with a piece of furniture having a bottom base surface comprising in combination

a shaft means adapted to be mounted to said base of a piece of furniture with said shaft extending in a vertical direction,

an upper member rotatably mounted on said shaft and having a downwardly facing inclined ramp surface,

abutment means concentric with said shaft means for spacing said upper member from said base surface and permitting relative rotational movement between said upper member and said base surface,

a lower foot member mounted to said shaft and having an upwardly facing inclined ramp surface abutting said ramp surface on said upper member, and

coil spring means mounted in coaxial relationship with said shaft in a compressed state between said upper and lower members to apply a torque between said members and to exert a force in a direction to push said members apart.

4,798,360

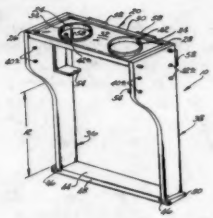
BEVERAGE CADDY APPARATUS

Sheldon Alter, 84 Butterworth Dr., Attleboro, Mass. 02703

Filed Jul. 17, 1987, Ser. No. 74,577

Int. Cl.[4] A47K *1/08*

U.S. Cl. 248—311.2 **12 Claims**



1. Beverage container support apparatus particularly adapted for automotive vehicles having center consoles in which are disposed vehicle related controls and having a floor mounted transmission lever comprising,

a tray portion extending transversely across and in front of a portion of the center console and having a depth sufficient to accommodate a beverage container receiving aperture, at least one container receiving aperture in the tray portion,

stop surface means mounted on the apparatus to limit downward movement of a container received in the at least one beverage container receiving aperture, the stop surface means including a generally "L" shaped member, a cross member attached to the top of the "L" shaped member, a mount member mounted on the apparatus having first and second intersecting grooves formed therein, means to bias the cross member into the first groove to maintain the "L" shaped member in one rotational orientation, the "L" shaped member being movable against the bias so that the cross member can be moved out of the first groove enabling it to be rotated until the cross member is received in the second groove in a second rotational orientation,

a pair of side members, one at each transverse end of the tray portion and connected thereto, the side members having a height sufficient to extend from a floor portion of the vehicle adjacent to and aligned with the console to place the tray portion within the field of vision of an operator of the vehicle looking through a windshield of the vehicle,

base means connected to the bottom portion of the side members and adapted to be placed on the said floor portion of the vehicle, and

attachment means disposed on the apparatus adapted to engage and attach the apparatus to the dash portion of the vehicle, the tray portion, side members and base means defining an open area therethrough to allow access to vehicle related controls behind the support apparatus, and the side members and base means being configured to provide access to the floor mounted transmission lever.

4,798,361

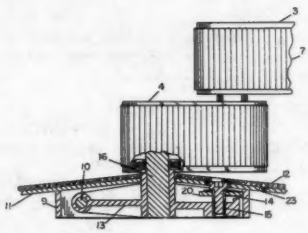
MULTI-SWIVEL CHAIR

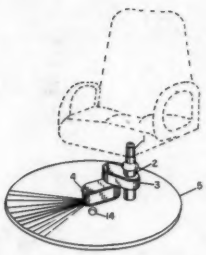
William H. Fawcett, 3730 Southview Dr. #437, San Diego, Calif. 92117

Filed Oct. 27, 1987, Ser. No. 112,881

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—415 **3 Claims**





1. An articulated multi-swivel-chair rotatable 360 degrees horizontally having a vertical axis centrally mounted on a circular floor pad, the chair carried by jointed arms rotating around the axis wherein the improvement comprises

a. the central axle being a vertical axle rotating in a sleeve bearing;

b. the sleeve bearing mounted upon a horizontal base plate;

c. a horizontal bearing shaft through one end of the base plate;

d. a vertical threaded hole on a longitudinal center line at the other end of the base plate;

e. a horizontal rectangular frame centrally fastened to the bottom of the circular floor pad;

f. the rectangular frame enclosing the base plate;

g. a bearing rod transversely through the walls of the rectangular frame engaging the horizontal shaft in the base plate;

h. a horizontal plate fastened to the rectangular frame above the vertical threaded hole in the base plate;

i. a clearance hole in the horizontal plate aligned with the threaded hole in the base plate; and,

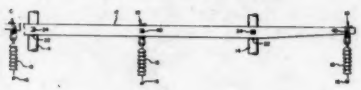
j. an allen bolt through the clearance hole in the horizontal plate engaging the threaded hole in the base plate.

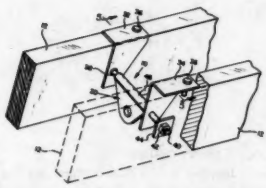
4,798,362

ADJUSTABLE CROSSARM SPACER AND UTILITY LINE HANGER APPARATUS

Arthur L. Troutner, Boise, Id., assignor to Trus Joist Corporation, Boise, Id.

Filed Dec. 15, 1983, Ser. No. 561,683
Int. Cl.[4] H02G 7/00
U.S. Cl. 248—62 **20 Claims**





1. Adjustable spacer and hanger apparatus for supporting an electrical utility line, comprising:

a pair of bracket members adapted for attachment to a pair of spaced elongated support members, each bracket member including a bracket plate and a threaded connector provided on said plate;

fastening means for attaching said bracket members to said support member;

rotatable hanger means for supporting the electrical utility line on said support members; and

adjustable connector means for connecting said hanger means to the two threaded connectors on said pair of bracket members so that the spacing between said bracket members can be adjusted by rotation of said hanger means about an axis of rotation to accommodate changes in the spacing between the pair of support members.

4,798,363

CONTAINER WITH LINING BAG DISPENSER

Roy L. Cortesi, P.O. Box 453, Greenville, Miss. 39502

Filed Oct. 23, 1987, Ser. No. 111,634
Int. Cl.[4] A63B 55/04
U.S. Cl. 248—97 **1 Claim**

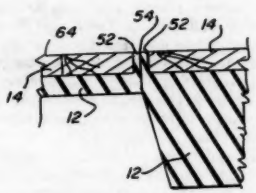
1. A wastebasket for using easily replaced inner liners to receive material, said wastebasket comprising an elongate sidewall forming an elongate enclosure, said enclosure being open at opposed ends, said sidewall comprising a lower edge having portions for engaging and resting on a generally flat floor and portions forming openings between said lower edge and said floor, a lower wall extending substantially completely across said enclosure and spaced from said lower edge by a distance less than that between said lower wall and an upper edge of said sidewall, said lower wall being convex with respect to said upper edge and comprising means forming a slot therein, said slot being centrally located in said lower wall with respect to one transverse dimension of said enclosure and extending a majority of the way across said lower wall in a perpendicular transverse dimension, one axle for revolvingly mounting a roll of said inner liners, and mounting means for removably mounting opposed ends of said axle, wherein said mounting means is located between said lower wall and said lower edge, and a lid for removably covering said end formed by said upper edge.

4,798,364

REINFORCED FORM LINER FOR SURFACE TEXTURING OF CONCRETE STRUCTURES

Samuel C. Scott, 2519 Walnut St., Denver, Colo. 80205

Filed Jan. 22, 1987, Ser. No. 6,013
Int. Cl.[4] E04G 9/05, 9/10
U.S. Cl. 249—189 **4 Claims**



1. A flexible surfaced plywood concrete form liner which can be used to form a textured surface in concrete wall construction, said form liner comprising:

(a) a flat planar sheet of relatively thick plywood material, said plywood sheet material being precisely sized for use in concrete wall construction;

(b) a layer of relatively thin, flexible, waterproof, elastomeric material, said elastomeric material being cast around and bonded to said plywood sheet, said elastomeric material forming a continuous integral coating covering one completed planar side of said plywood material and all edges of said plywood material leaving the opposite side exposed, the elastomeric material along the edges having a thickness within the range of $\frac{1}{8}$th to $\frac{1}{4}$ths inch to provide a flexible seal between forms and yet have sufficient rigidity to prevent concrete blow-out at the joint;

(c) the outer surface of said layer of elastomeric material opposite said plywood material having a negative impression textured surface which is intended for texturing the surface of the finished concrete; and

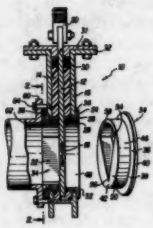
(d) said elastomeric material completely seals one side and all edges of said plywood material to prevent any possible absorption of the concrete or moisture into the lamination of the plywood material during use to greatly extend the useful life of the form.

4,798,365

THROTTLING GASKET INSERT FOR USE WITH KNIFE GATE VALVE

John Mayhew, Salem, Va., assignor to Alphabet, Inc., Warren, Ohio

Filed May 20, 1987, Ser. No. 52,106
Int. Cl.[4] F16K *3/32, 3/02*
U.S. Cl. 251—205 **3 Claims**



1. A throttling gasket insert to be used for converting any one knife gate valve of a plurality of knife gate valves of different sizes and tolerances into a throttling configuration in which it can be used for more finely controlling flows of fluids through a flow passage, said throttling gasket inserts being used to sealingly attach said any one knife gate valve to a pipe string, said plurality of knife gate valves being of a type comprising a gate blade being longitudinally movable in a frame to open and close a lateral flow passage through the frame, said knife-gate valves each defining an annularly-shaped facing surface on an outer surface of the frame surrounding the passage for making sealing contact with pipe flange and a flow-passage bore extending into said mouth of said flow passage, said bore having a standard fixed diameter, said throttling gasket insert comprising a single piece of resilient polymer plastic gasket material of a type to be clamped between flanges of two flow members for forming a seal therebetween, said throttling gasket insert comprising:

a washer-shaped flange portion of a size for being placed between said facing surface surrounding said flow passage and a pipe flange of a pipe to be attached to said knife gate valve at said facing surface, said washer-shaped flange having a generally circular outer perimeter;

a tubular portion being formed as one piece with said flange portion and protruding outwardly from one side of said flange portion said tubular portion having a generally circular-in-cross-section outer surface which is coaxial with, but substantially smaller than the generally circular outer perimeter of said circular washer-shaped flange, said outer surface being of a size and shape for snugly extending into said flow passage, said tubular portion having a flat inner-end throttling seat facing away from said flange portion for being immediately adjacent a knife gate blade when it is in a closed position, said tubular portion having an axial passage therethrough which is V-shaped in cross section, said V-shaped passage extending from said inner end throttling seat over at least substantially half the complete axial length of said tubular portion;

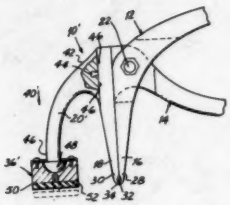
whereby said tubular portion of said throttling gasket insert can be inserted into the lateral flow passage, with said flange portion being seated against the facing surface thereof and said inner-end throttling seat being immediately adjacent said longitudinally-movable gate blade, said throttling gasket insert being formed of one piece of material so that its inner-end throttling seat can be cut away to shorten the length of said tubular portion and a circumferential surface of said tubular portion can be cut away to shorten the length of said tubular portion and a circumferential surface of said tubular portion can be cut away so that it will fit into a smaller flow passage without changing the characteristics of said v-shaped passage therethrough thereby adapting said throttling gasket to sealingly attach to any one of said plurality of different size knife-gate valves having lateral flow passages therethrough, into pipe strings to allow said knife gate valves to be used in said pipe strings as V-shaped passage throttling valves.

4,798,366

SHAKE NAIL PULLER

Victor I. Pearson, and George Spector, both of 233 Broadway, RM 3615, New York, N.Y. 10007

Filed Nov. 13, 1984, Ser. No. 671,088
Int. Cl.[4] B25C *11/00*
U.S. Cl. 254—22 **3 Claims**



1. A nail puller pliers comprising:

(a) a first arm having a first end formed with a handle and a second end formed with a first jaw having a free end;

(b) a second arm having a first end formed with a handle and a second end formed with a second jaw having a free end;

(c) a fulcrum lever mounted on said second end of said second arm having a free end;

(d) a resilient pad mounted to said free end of said fulcrum lever;

(e) a pivotal connection between said first and second arms providing a first axis for rotating said jaws towards and away from each other, wherein said lever is mounted rotatably about an axis perpendicular to the first said axis whereby said lever is moveable to transverse displaced positions parallel to said first axis including further means to lock said fulcrum lever in any one of said displaced positions whereby said pad can be located at various positions parallel to said first axis.

4,798,367

APPARATUS OF COOLING STEEL STRIP IN CONTINUOUS HEAT TREATING LINE

Sachihiro Iida, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 842,136, Mar. 20, 1986, Pat. No. 4,713,125.
This application Sep. 1, 1987, Ser. No. 91,718
Claims priority, application Japan, Mar. 22, 1985, 60-56093
Int. Cl.[4] C21D *11/00*
U.S. Cl. 266—80 **5 Claims**

1. An apparatus for cooling a steel strip which has been cooled through a final cooling zone in a continuous heat treating line comprising

a cooling tank containing cooling water;

one or more sink-rolls arranged in the cooling water to guide the steel strip in the cooling tank;

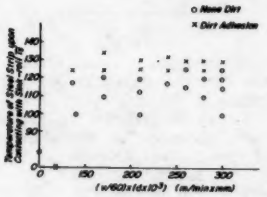
a guide roll provided at the inlet of the cooling tank for guiding the steel strip from the outlet of the final cooling zone to the first one of the sink-rolls in the cooling water;

means for detecting the temperature (Tw) of the cooling water in which said first sink-roll is immersed;

means for detecting the temperature (Ts) of the steel strip at the inlet of the cooling tank; and

a processing unit adapted for operating one or more control-

lers to cool the steel strip immersed in the cooling water prior to reach to the first sink-roll to such a lower temperature as to prevent evaporation of a water film interposed



between surface of the first sink-roll and the surface of the strip around the first sink-roll in accordance with the following formula:

$$l \geqq \frac{\rho \cdot Cp \cdot v \cdot d}{2\alpha} \cdot \ln\left(\frac{Ts - Tw}{120 - Tw}\right)$$

here,

l is the cooling length from the surface of the cooling water to the sink-roll (m)

Ts is the temperature of the steel strip at the inlet of the cooling tank (°C.)

Tw is the temperature of cooling water (°C.)

Cp is the specific heat of the steel strip (Kcal/kg°C.)

v is the feed speed of the steel strip (m/hr)

d is the thickness of the steel strip (m)

α is the coefficient of heat transfer (Kcal/m²hr°C.)

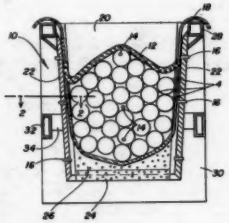
ρ is the density of the steel strip (kg/m³).

4,798,368

APPARATUS FOR CONTROLLED SLOW COOLING OF STEEL TUBULARS

Joseph F. Colin, Darlington; Leo T. Kaercher, Beaver Falls, and Charles D. Roberts, Gibsonia, all of Pa., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 30, 1987, Ser. No. 79,843
Int. Cl.⁴ C21D 9/08
U.S. Cl. 266—259 **8 Claims**



1. An apparatus for treating hot steel stock after it is milled, comprising:

a container having insulated side walls, insulated end walls, a bottom wall and an open top;

insulation means in said container over said bottom wall for insulating the bottom of said container;

a flexible, removable blanket of insulating material for covering the open top of said container to cover a load of hot steel stock in said container to control the rate of cooling of the hot steel stock; and

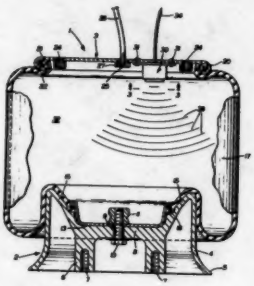
sling means lining said container on which steel stock is engagable for facilitating the removal of steel stock from said container.

4,798,369

ULTRASONIC AIR SPRING SYSTEM

Wayne H. Geno, Cicero, Ind., and David A. Weitzenhof, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1987, Ser. No. 116,189
Int. Cl.⁴ B60G 17/04, 17/08
U.S. Cl. 267—64.11 **6 Claims**



1. An ultrasonic air spring leveling system including:

(a) an end plate and a piston member located in a generally axial spaced relationship when in an at-rest position, said end plate and piston member being adapted to be mounted on spaced portions of a vehicle and movable towards and away from each other upon said vehicle encountering road shocks to absorb said shocks and to maintain said spaced vehicle portions at a predetermined spaced relationship when in said at-rest position;

(b) a fluid pressure chamber formed between said end plate and piston member by a flexible elastomeric sleeve having opposed open ends sealingly connected to said end plate and piston member;

(c) an ultrasonic transducer mounted on an inside surface of the end plate and located within the fluid pressure chamber for transmitting ultrasonic signals through the pressure chamber to the piston member and for picking up ultrasonic signals reflected from the piston member;

(d) electronic circuit means operatively connected to the transducer responsive to the picked up signals for generating a control signal; and

(e) a source of pressurized fluid connected to the fluid pressure chamber and controlled by the control signal for regulating the amount of fluid within said pressure chamber to maintain a predetermined axial separation between the end plate and piston member when in said at-rest position.

3. An improved method for regulating the spacing between an end plate and a piston member sealingly mounted within the open ends of a flexible elastomeric sleeve of an air spring of a suspension system including the steps of:

(a) forming a pressurized fluid chamber within the elastomeric sleeve and between the end plate and piston member;

(b) transmitting ultrasonic signals from a transducer located within the chamber and mounted on an inside surface of said end plate towards the piston member;

(c) detecting a portion of the transmittal signals which are reflected from the piston member;

(d) determining the spacing between the end plate and piston member in response to the detected, reflected signals;

(e) generating a control signal in response to the determined spacing between the end plate and piston member; and

(f) regulating the amount of pressurized fluid within the fluid chamber in response to the control signal for adjusting the spacing between said end plate and piston member.

4,798,370

UPPER SUPPORT FOR A SUSPENSION OF A VEHICLE

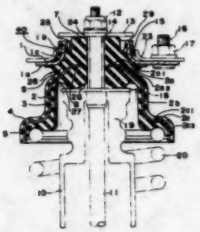
Yutaka Inuzuka, Nishio, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 11, 1988, Ser. No. 180,138

Claims priority, application Japan, Apr. 15, 1987, 62-53941[U]

Int. Cl.[4] F16F 9/32; B60G 15/06

U.S. Cl. 267—220 **15 Claims**



1. An upper support for a suspension including a shock absorber and a coil spring located between a vehicle body and a wheel, the upper support being attached to said shock absorber between upper and lower retainers located on opposite sides of a collar coupled to an absorber rod of said shock absorber, said upper support, said shock absorber and said coil spring having a common axis, said upper support comprising:

a first generally annular rigid member including a substantially cylindrical portion and a flange portion extending radially outward from a lower end portion of said substantially cylindrical portion;

a second generally annular rigid member arranged below said first rigid member in an axial direction and including: a substantially flat portion extending perpendicular to said axis of said upper support and having an inner diameter smaller than an inner diameter of said first rigid member; a substantially conically extending portion extending obliquely downward from a radially outer end portion of said substantially flat portion and having an outer diameter larger than the inner diameter of said first rigid member; a substantially cylindrical portion extending downward from a lower end portion of said substantially conically extending portion; and a spring seat portion extending generally radially outward from a lower end portion of said substantially cylindrical portion;

an elastic generally annular member elastically connecting said first and second rigid members, and having a radially inner slidable surface for slidably contacting the collar coupled to the absorber rod of the shock absorber, said elastic member including: a first portion provided between said first rigid member and said substantially conically extending portion of said second rigid member in the axial direction and fixed to said first and second rigid members; a second portion provided above and fixed to said substantially flat portion of said second rigid member, said second portion being compressed in the axial direction between said substantially flat portion of said second rigid member and the upper retainer coupled to the absorber rod; and a third portion provided below and fixed to said substantially flat portion and said substantially conically extending portion of said second rigid member, said third portion being compressed in the axial direction between said substantially flat and substantially conically extending portions of said second rigid member and the lower retainer coupled to the absorber rod; each of said first, second and third portions being used in a compression direction; and

an elastic seat fixed to a lower surface of said spring seat portion of said second rigid member to receive loads from the coil spring.

4,798,371

CHUCKING DEVICE, IN PARTICULAR A VISE

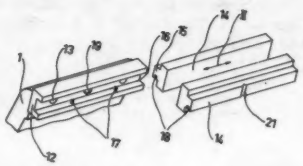
Klaus Wallisser, Haanfwiesenstrasse 17, 7060 Schorndorf, Fed. Rep. of Germany

Filed Sep. 24, 1987, Ser. No. 100,393

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632496; Mar. 24, 1987, 3709566

Int. Cl.[4] B25B 1/24

U.S. Cl. 269—283 **3 Claims**



1. A chucking device, in particular a vise, comprising two chuck jaws secured parallel to one another on stable supporting elements movable relative to one another in a direction of a clamping force exerted thereby, at least one of the two jaws having first and second parts, a first pedestal part secured to the respective supporting element and a second interchangeable part replaceably joined to the first pedestal part for gripping a workpiece, both said parts having sides facing one another provided with rail guide means transverse to the direction of the clamping force, said rail guide means being adapted to allow a longitudinal displacement of the interchangeable part from the pedestal part for removal and replacement thereof, the rail guide means being provide with a U-shaped cross section on one part of a respective jaw serving as a receiving recess for a T-shaped cross section of a base portion of the other parts, said T-shaped cross-section being adapted to protrude into said receiving recess, said U-shaped cross-section including upper and lower inner leg surfaces from at least the lower of which inner leg surface pin-like protrusions extend, said protrusions being adapted to engage a corresponding groove provided on an opposing face portion of the base of the second interchangeable part to retain same from unintentional disengagement.

4,798,372

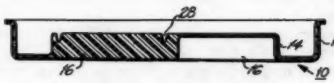
CUTTING TRAY

Joseph R. Tingle, 328 S.E. 17th Pl., Cape Coral, Fla. 33990

Filed Sep. 8, 1987, Ser. No. 93,729

Int. Cl.[4] B23Q 1/00

U.S. Cl. 269—59.5 **12 Claims**



1. A cutting tray comprising:

a molded, rectangular pan having a peripheral upright rim forming four sides;

a raised rectangular platform support integrally formed with

said pan positioned within and displaced from said four sides;

said platform support having an upper surface having a plurality of spaced receptacles therein;

a dense molded rectangular cutting platform having a cutting surface area and said platform removeably secured to said platform support; and

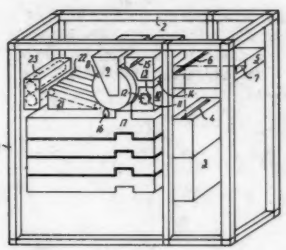
said cutting platform having an under surface having a plurality of spaced protuberances positioned to mate with said spaced receptacles.

4,798,373

SHEET FEEDING DEVICE FOR USE IN AN ELECTROPHOTOGRAPHIC INFORMATION PRINTER

Hans C. Hyltoft, Vaerloese, Denmark, assignor to Mercante International A/S AF 1986, Glostrup, Denmark

Division of Ser. No. 662,553, Oct. 19, 1984, Pat. No. 4,605,215.
This application Nov. 25, 1985, Ser. No. 802,156
Claims priority, application Denmark, Nov. 3, 1983, 5047/83; Sep. 14, 1984, 4388/84
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[4] B65H *3/44*
U.S. Cl. 271—9 7 Claims



1. In an electrophotographic information printer with a xerographic system controlled by a program-controlled unit, a sheet feeding device for advancing individual sheets of a printing material from a sheet supply to an image transfer device arranged in operational cooperation with a movable photoconductor, said sheet feeding device comprising

a collecting roller arranged for engagement with the upper sheet in the sheet supply,

a pair of advancing rollers including a driven roller,

individual drive means including an electronic stepping motor being mechanically coupled to said collecting roller and said driven advancing roller through transmission members, the collecting roller being coupled with the stepping motor through a transmission member allowing free-wheeling with opposite direction of the stepping motor relative to the direction prescribed for the operation of the collecting roller, and

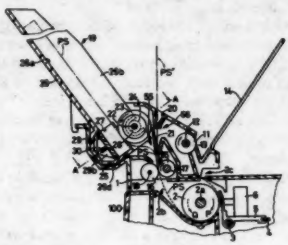
a device responsive to the program-controlled unit for supplying to the stepping motor a predetermined number of pulses at a controlled pulse frequency to operate the stepping motor in an operational sequence for said information printer, whereby the collecting roller and the driven advancing roller are rotated with controllable rotational speed, direction and duration.

4,798,374

SWITCHABLE AUTOMATIC OR MANUAL MODE PAPER FEEDING DEVICE HAVING A BIDIRECTIONALLY OPERATED MOTOR FOR A PRINTER

Noritugu Ito, Chita, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 3, 1986, Ser. No. 925,977
Claims priority, application Japan, Nov. 8, 1985, 60-251647
Int. Cl.[4] B65H *1/14, 5/26*
U.S. Cl. 271—9 20 Claims



20. A paper feeding device for a printer, comprising:

a paper stacker for storing a stack of paper sheets;

a feed roller disposed for contact with a top of said stack of sheets and rotatable for feeding a top sheet of said stack from said paper stacker;

drive means for rotating said feed roller;

first passage means for defining a first paper path for directing said top sheet fed by said feed roller to said printer;

second passage means for defining a second paper path which has a paper inlet through which another sheet of paper is manually inserted into said printer, without said another sheet passing from said feed roller; and

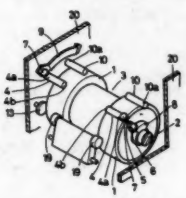
an electrically conductive partition wall which is connected to a ground and which is disposed between said first and second paper paths, so as to separate said first and second paper paths from each other, said first and second passage means guiding said top sheet and said another sheet along said first and second paper paths such that said top sheet and said another sheet contact said partition wall.

4,798,375

DEVICE FOR FEEDING PHOTOSENSITIVE MATERIAL

Yuji Yamamoto, Wakayama, Japan, assignor to Noritsu Kenkyu Center Co., Ltd., Wakayama, Japan

Filed Jan. 15, 1987, Ser. No. 61,517
Claims priority, application Japan, Jun. 16, 1986, 61-92158; Jun. 23, 1986, 61-96602; Jul. 14, 1986, 61-108407
Int. Cl.[4] B65H *5/00*
U.S. Cl. 271—82 3 Claims



1. A device for use with a photographic processor to feed a web of photosensitive material comprising:

a cylindrical feed drum rotatable about a horizontal axis;
at least one head presser bar movably mounted on a peripheral surface of said cylindrical feed drum so as to be movable toward and away from the axis of said feed drum;
at least one tail presser bar pivotally mounted on said peripheral surface of said cylindrical feed drum about a pivot axis extending radially outwardly from the cylindrical surface of the feed drum, said tail presser bar being circumferentially spaced from said head presser bar, and pivotal movement of said tail presser bar moving it between a first position parallel to said drum axis and a second position so as to move one end thereof toward and away from said drum surface;
means operable in synchronism with rotation of said feed drum to move said head presser bar away from said surface at a first rotational position of said drum to accept a head end of said web, fed from a first unit of said photographic processor, between said head presser bar and said drum surface, and thereafter to move said head presser bar toward said surface to press and hold said web head end thereagainst;
means operable in synchronism with further rotation of said feed drum to raise and pivot said tail presser bar away from said drum surface at a second rotational position of said drum so as to receive a tail end of said web between said tail presser bar and said drum surface, and thereafter to lower and pivot said tail bar toward said surface so as to press and hold said web tail end against said surface;
further rotation of said drum moving said web head end to a second unit of said photographic processor, circumferentially remote from said first unit of said photographic processor, said second unit having means positioned near said drum to receive said head end of said web and draw said web into said second unit; and
means operable in synchronism with rotation of said feed drum for moving said head presser bar and said tail presser bar away from said drum surface to release said head end and said tail end, respectively, adjacent said second unit receiving means.

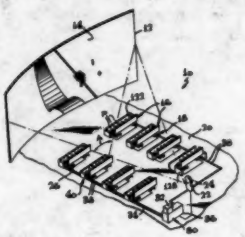
4,798,376

AMUSEMENT RIDE APPARATUS WITH A PLURALITY OF INDIVIDUALLY TILTABLE FRAMES

Douglas Trumbull, Santa Monica; David Collins, Westlake Village; Wayne Smith, Los Angeles, all of Calif., and Robert Spieldiener, Vaduz, Liechtenstein, assignors to Showscan Film Corporation, Culver City and Intamin Corp. Inc. Est., Berkely, both of, Calif.

Continuation of Ser. No. 811,104, Dec. 19, 1985. This application Nov. 16, 1987, Ser. No. 121,122
Int. Cl.[4] A63G *31/16*
U.S. Cl. 272—18 **2 Claims**

1. An amusement ride apparatus comprising:
means for holding a plurality of passengers;
image means including a screen viewable by said passengers and means for forming a predetermined motion picture image on said screen with at least a portion of said image representing the view from a moving vehicle;
drive means for moving said passenger holding means in synchronism with said motion picture image to simulate, at least partially, forces that would be experienced by passengers in said moving vehicle;
said means for holding passengers comprising a plurality of passenger-holding frames, said drive means comprising a plurality of sets of actuators, each said set of actuators associated with a different one of said frames and controllable to move the corresponding frame, and aid drive means includes means for controlling said sets of actuators in synchronism;
each said passenger-holding frame includes a plurality of seats positioned to hold seated passengers facing in a predetermined forward direction towards said screen;
each said set of actuators is constructed to tilt said seats about an axis (82) that extends primarily horizontally and perpendicular to said forward direction;
said screen is substantially stationary;
said plurality of seats of each said passenger-holding frame



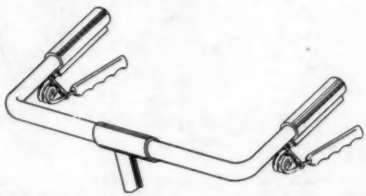
are arranged in at least one row containing a plurality of seats spaced substantially parallel to said axis; and
each said frame being tiltable about its own individual said axis with said axis of one of said frames spaced further from said screen than said axis of a second of said frames.

4,798,377

BICYCLE HANDLE BAR GRIP WITH EXERCISE

James P. White, 8040 S. Yale, Chicago, Ill. 60620

Filed Nov. 16, 1987, Ser. No. 120,642
Int. Cl.[4] A63B *5/00*; B62K *21/26*
U.S. Cl. 272—67 **3 Claims**



1. A bicycle handle bar exercise grip comprising:
(a) a coil spring with both ends extended longitudinally about a pivot axis, said coil spring ends having a given cross sectional area throughout their length,
(b) an elongated handle with finger receiving portions along the bottom surface, and with an orifice above said portions extending longitudinally into said handle to allow insertion by one of said coil spring ends,
(c) an elongated handle bar grip with an upper orifice extending longitudinally into said handle bar grip for insertion by bicycle handle bar, and a smaller rigid orifice, below said upper orifice, extending longitudinally into said handle bar grip parallel to the upper orifice, said smaller orifice having a stabilizing means to prevent the other said coil spring end from rotating when inserted into the smaller orifice,
(d) said elongated handle and said elongated handle bar gri providing a variable gripping means for the hand of a bicycle rider,

(e) said coil spring having a spring constant K large enough to stabilize said elongated handle and said elongated handle bar grip in the open position when gripped by a partially open hand, whereby the bicycle handle bar exercise grip can be mounted on a bicycle hand bar and provides a variable grip and hand muscle exercise.

4,798,378

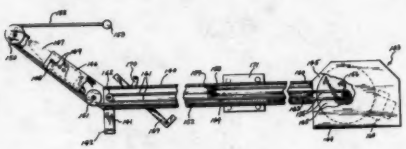
ROWING MACHINE

Robert S. Jones, 2943 North Hackett Ave., Milwaukee, Wis. 53211

Continuation-in-part of Ser. No. 754,719, Jul. 15, 1985, abandoned. This application Jul. 28, 1986, Ser. No. 891,439

Int. Cl.[4] A63B *69/06*

U.S. Cl. 272—72 **26 Claims**



1. A rowing exerciser, comprising:
a horizontal frame;
a seat mounted for movement along the frame;
stationary foot rests on the frame;
a flywheel rotatably mounted adjacent the frame;
handle means for rotating the flywheel;
an eddy current brake coupled to the flywheel to resist rotation of the flywheel by the handle means; and
said eddy-current brake comprises a nonmagnetic conducting rim on said flywheel and stationary means adjacent said rim for creating a magnetic field through which the rim rotates.

4,798,379

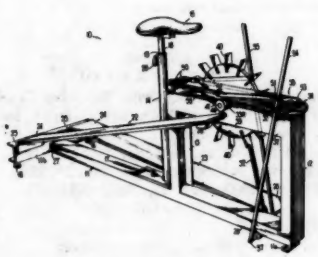
EXERCISE MACHINE

John W. Jenkins, Hampton, Ga., assignor to Bellwether, Inc., Atlanta, Ga.

Filed Aug. 7, 1987, Ser. No. 82,742

Int. Cl.[4] A63B *21/00, 1/00*

U.S. Cl. 272—73 **3 Claims**



1. An exercise machine comprising:
a rotatable device for dissipating energy;
a pair of foot treadles pivotally mounted in predetermined relation to said rotatable device and operatively interconnected for alternating reciprocable movement causing movement of each foot treadle in a first direction in response to movement of the other foot treadle in a second direction, and vice versa;
means operatively interconnecting said foot treadles to impart continuous rotary motion to said rotatable device in response to alternate reciprocation of the foot treadles by a user of the exercise machine;
a pair of hand levers mounted in predetermined relation to said rotatable device and operatively interconnected for alternating reciprocal movement causing movement of each hand lever in a first direction in response to movement of the other hand lever in a second direction by the user, and vice versa;
means operatively interconnecting said hand levers to impart continuous rotary motion to said rotatable device in response to alternate reciprocation of the hand levers by the user, so that the user can expend energy in driving the rotatable device by using feet or hands, or both feet and hands;
said operative interconnection between the hand levers comprising a flexible link connected with both said hand levers and passing over a pulley which reverses the direction of the flexible link, so that one hand lever is moved in a direction toward the user when the other hand lever is moved in a direction away from the user, and vice versa;
said operative interconnection between the foot treadles comprising a flexible link connected with both said foot treadles and passing over a pulley which reverses the direction of the flexible link, so that one foot treadle is raised by the last-mentioned flexible link when the other foot treadle is depressed by the user, and vice versa; and
means operatively interconnecting the foot treadles with the hand levers so that reciprocation of either treadle causes reciprocation of both hand levers, and vice versa,
whereby the energy expended by the user in alternately reciprocating the foot treadles or the hand levers drives the rotary device at a substantially constant rate throughout the movement of each foot treadle or hand lever and is there dissipated.

4,798,380

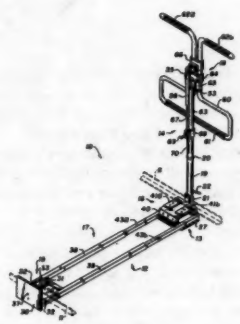
STOWABLE EXERCISING APPARATUS

Edward Masyk, C55-Padgett Rd., Powell River, British Columbia V8A 4Z2, Canada

Filed Jun. 16, 1987, Ser. No. 63,209

Int. Cl.[4] A63B *23/00*

U.S. Cl. 272—93 **7 Claims**



1. A stowable exercising apparatus adapted to be mounted to the frame of a bed, comprising:
means for securing said apparatus to said bed frame comprising a pair of adjustable securing brackets adapted to be secured at opposite sides of said bed frame, said securing brackets being connected by means of an adjustable framework extending from one bracket to the other;
supporting means for supporting said apparatus on said adjustable framework and adapted for slidable movment on said adjustable framework; and
exercising means mounted to said supporting means and

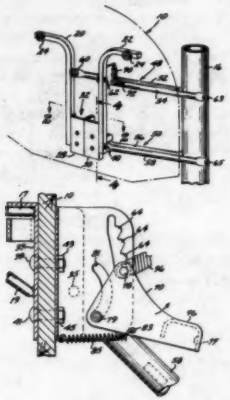
adapted to be movable from a vertical operating position along said be to a horizontal resting position under said bed wherein said supporting means comprises a base slidably mounted on said framework and has pivoting means for connecting said exercise means to said base to permit said exercising means to be pivoted to a horizontal position and then slidably moved to said resting position.

4,798,381

BASKETBALL GOAL HEIGHT ADJUSTMENT APPARATUS

Bemanali H. Dadbeh, Seal Beach, Calif., assignor to Harvard Sports, Inc., Compton, Calif.

Filed Jul. 6, 1987, Ser. No. 69,882
Int. Cl.[4] A63B *63/08*
U.S. Cl. 273—1.5 R **14 Claims**



1. A basketball backboard adjustment apparatus for varying the height of a basketball backboard and hoop comprising:

first and second frame members each secured at one end to the rear surface of said backboards;

first and second sets of parallelogram bars respectively disposed on opposite sides of said and pivotally coupled to said first and second frame members respectively, each set of parallelogram bars comprising first and second bar members;

a bracket assembly having first, second and third portions, said first portion being secured to the rear surface of said basketball backboard, said second portion being affixed to said first frame member and said third portion being affixed to said second frame member; said bracket assembly including a member having an opening and extending in a direction away from said first portion of said bracket assembly, said opening having a plurality of notches formed therein;

a bifurcated member having two arm portions separated by a gap;

a pin member extending between said bifurcated arm members through said opening; and

means for pivotally securing said bifurcated member to one bar of said first set of parallelogram bars and a corresponding bar of said second set of parallelogram bars.

4,798,382

DOUBLE INVERTED BRIDGE TENNIS RACKET

Richard Janes, Belchertown, Mass., assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Jan. 16, 1987, Ser. No. 3,687
Int. Cl.[4] H63B *51/10*
U.S. Cl. 273—73 C **5 Claims**

1. A tennis racket comprising

a substantially oval head including a plurality of main strings and cross strings;

a handle;

a throat interconnecting said head and said handle, said head, throat, and handle lying in a common plane;

a first arcuate bridge connected to said oval head adjacent said throat and extending within said oval head and lying in said common plane;

a second arcuate bridge connected to said head and extending within said head opposite said first arcuate bridge and lying within said common plane;

a preselected number of grommets extended through each of said first and second arcuate bridges; and

a preselected number of said main strings passing through said grommets in said first and second arcuate bridges and supported at said frame, a selected number of said preselected main strings being crisscrossed between said first arcuate bridge and said frame and between said second arcuate bridge and said frame.

4,798,383

GOLF CLUB HEAD

Yoichi Nagasaki; Itsushi Nagamoto; Toyohiko Tadokoro, and Masaki Fujimura, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

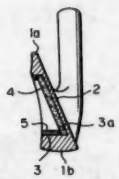
Filed Jan. 21, 1986, Ser. No. 821,029
Claims priority, application Japan, Jan. 29, 1985, 60-15145; Sep. 9, 1985, 60-199034; Sep. 27, 1985, 60-214297
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—167 H **2 Claims**

1. An improved golf club head comprising:

a main body constructed of metal and having a face side section of substantially uniform thickness and providing a planar face side surface for striking golf balls, said main body having a rear opening extending therein towards said face side surface between upper and lower edges of said body to an end wall provided by a rear side surface of said face side section,

a fiber reinforced plastic plate of substantially uniform thickness in the range of 5.0 mm or less fixed to said end wall parallel to said face side surface, the upper and lower edges of said body forming said opening extending beyond

the thickness of said fiber reinforced plastic plate, said fiber reinforced plastic plate being formed as a solid planar body having uniform density throughout, the density of



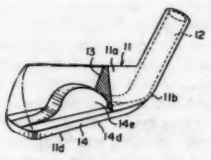
said fiber reinforced plastic plate being such that it provides a lighter mass than would otherwise be present if said fiber reinforced plastic plate were made of the same material as that of said main body.

4,798,384

CLUB-HEAD

Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan

Division of Ser. No. 837,981, Mar. 10, 1986, Pat. No. 4,690,408. This application May 27, 1987, Ser. No. 55,803
Claims priority, application Japan, Mar. 14, 1985, 60/49378
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—172 **3 Claims**



1. A club-head for a gold club made of metal comprising an outer shell which includes the striking face of the club head and is made of a first metal and a core body made of a second metal, said first metal having different specific weight from said second metal, said core body having a sole and a protrusion extending integrally and upwardly from said sole into said outer shell, said sole being exposed outside of substantially the whole bottom of said outer shell, said protrusion being embedded in said metal of said outer shell and having a size and upward extent such that the weight of said core body is concentrated at substantially the center of the hitting portion of said club head, said core body being integrally secured to said outer shell substantially by said embedded protrusion.

4,798,385

DOUBLE ENDED GOLF COURSE

Harold G. Tegart, 9147 Foothill Blvd., Sunland, Calif. 91040

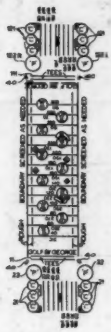
Division of Ser. No. 814,601, Dec. 30, 1985, Pat. No. 4,696,474, which is a continuation-in-part of Ser. No. 431,567, Sep. 30, 1982, Pat. No. 4,572,512. This application May 4, 1987, Ser. No. 20,563
Int. Cl.[4] A63B *69/36, 67/02*
U.S. Cl. 273—176 A **5 Claims**

1. A double ended compact golf course comprising a common fairway region of at least 300 yards in length;

a plurality of range markers positioned along said common fairway region, at least some of said range markers visible to players at each end of said double ended compact golf course;

a set of tees, each located at opposite ends of said common fairway region and aimed thereat;

the range markers of said common fairway region positioned to display the range from each of the sets of tees;



target means on said common fairway region for the golfers at each end of said double ended compact golf course; and

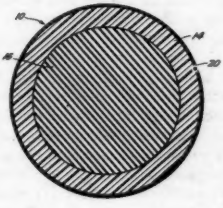
actual greens adjacent to said tees at each end of said fairway region for chipping and putting after completion of fairway play.

4,798,386

GOLF BALL WITH FLUORESCENT COVER

Raymond A. Berard, Portsmouth, R.I., assignor to Acushnet Company, New Bedford, Mass.

Continuation of Ser. No. 946,105, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 786,131, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 383,379, May 28, 1982, abandoned. This application Feb. 11, 1988, Ser. No. 154,533
Int. Cl.[4] A63B *37/12*
U.S. Cl. 273—235 R **5 Claims**



1. A golf ball comprising a core and a fluorescent cover, said cover having a fluorescent material admixed therein, said fluorescent material being selected from the group consisting of 2.0 to 6.0% by weight of the cover of fluorescent pigments and 0.04 to 0.4% by weight of the cover of fluorescent dyes, the outermost surface of said golf ball having a transparent coat on the outer surface of said fluorescent cover, said golf ball having greater appearance durability than it would otherwise have in the absence of said fluorescent material, and higher gloss than it would otherwise have without said transparent coating.

4,798,387

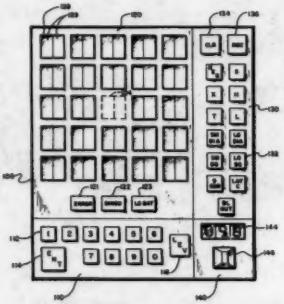
MULTIPLE BINGO GAMING BOARD

John Richardson, San Diego, Calif., assignor to Selectro-Vision, Ltd., San Diego, Calif.

Continuation of Ser. No. 441,771, Nov. 15, 1982, abandoned, Continuation-in-part of Ser. No. 079,807, Sep. 28, 1979, Pat. No. 4,365,810. This application Jan. 5, 1987, Ser. No. 4,294

Int. Cl.[4] A63F 3/06

U.S. Cl. 273—237 15 Claims



1. A hand held chance based gaming board comprising:

electronic display means for visually displaying a plurality of symbols from a predetermined array of symbol display locations;

computer means including a control program stored in a memory means, data processor means controlled by said control program, data storage means including a plurality of symbol storage locations, and means for generating control signals;

means for storing a predetermined array pattern;

input switch means for selecting any one of a plurality of symbols;

means for visually indicating a pattern match between said predetermined array pattern and the pattern of symbols stored in said predetermined array of symbol display locations;

means for selecting a first loading mode;

said computer means, in response to said first loading mode, generating control signals causing the present state of said input switch means to be sensed, causing said data storage means to store said selected symbols in a predetermined sequence in said symbol storage locations, and causing said display means to display said selected symbols in corresponding symbol display locations;

means for selecting a second playing mode, said second mode being independent of said first mode;

said computer means, in response to said second playing mode, generating control signals causing each actuation of an input switch means to be sensed, causing each symbol storage location in which said sensed symbol is stored to be identified, causing said identified symbol display location to be compared with said predetermined pattern, and causing said pattern match indicating means to be actuated if a match is detected;

timing means for limiting the length of time of said first game mode;

shut-off means for deactivating said input switch means and said means for selecting said second playing mode; and

said computer means, in response to said first loading mode, generating control signals causing the present state of said timing means to be periodically sensed, and causing said shut-off means to deactivate said input switch means and said means for selecting said second playing mode when a limited time allocated for said first loading mode has expired.

4,798,388

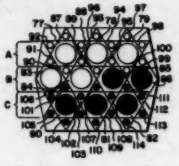
GAME BOARD

Marvin A. Nelson, 801 E. Decker St., Viroqua, Wis. 54665

Division of Ser. No. 765,942, Aug. 15, 1985, Pat. No. 4,684,134. This application Jun. 11, 1987, Ser. No. 60,685

Int. Cl.[4] A63F 3/02, 3/00

U.S. Cl. 273—261 18 Claims



11. A game board adapted for a game playing involving two opposing players equipped with an opposing set of major game playing pieces and an opposing set of minor playing pieces, said game board comprising a plurality of hexagonal spaces horizontally positioned and aligned in rows upon the game board and a plurality of triangular spaces abutting the sides of the hexagonal spaces so as to provide in combination with said hexagonal spaces an arrangement of a plurality of hexagrams, said plurality of hexagrams being arranged upon said game board in a first outer row of horizontally aligned hexagrams, a second outer row of horizontally aligned hexagrams of an equal number of hexagrams as contained in said first outer row and an inner row which contains at least one hexagram, said inner row being further characterized as containing a greater number of hexagonal spaces than said first outer row and said horizontally aligned hexagonal spaces of said inner row are positioned upon said game board in diagonal alignment with the hexagonal spaces of said first outer row and said second outer row, with said hexagonal playing spaces affording upon said game board playing spaces for the emplacement and game play thereupon by the opposing set of major playing pieces and the triangular spaces affording playing spaces for the emplacement and game play thereupon by the opposing set of minor playing pieces.

4,798,389

APPARATUS FOR PLAYING INDOOR BASEBALL INDOOR SOFT BALL OR INDOOR TEE-BALL

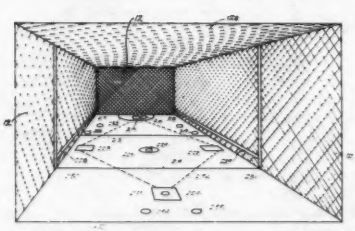
Geoffrey E. Long, Leeming, Australia, assignor to Long Enterprises Pty. Ltd., West Perth, Australia

Filed Mar. 24, 1987, Ser. No. 29,548

Claims priority, application Australia, Mar. 27, 1986, PH 5239

Int. Cl.[4] A63B 67/00

U.S. Cl. 273—411 6 Claims



1. Apparatus for the playing of indoor baseball, indoor softball or indoor tee-ball by a plurality of players of opposing

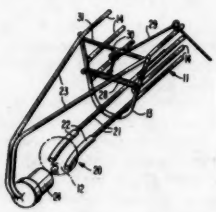
teams comprising a batting team and a fielding team, said batting team being comprised of batters and said fielding team being comprised of fielders and at least one pitcher for pitching a ball, said apparatus comprising: an arena having a playing area provided with a circuit defined by a plurality of bases including a home base; wall means surrounding said playing area and roof means overlying said playing area above said wall means; said playing area being defined by at least four boundary lines at least two dividing lines extending between at least two of said boundary lines such that said playing area is divided into a least three zones comprising a first zone, a second zone, and a third zones with one of said dividing lines separating said first zone and said second zone and said third zone; at least separating said second zone and said third zone; at least one base of said plurality of bases, not being said home base, being located in said second zone and at least one of said fielders being allocated to said base located in said second zone; one of said batters being positionable in said third zone to take pitched balls from said pitcher; wherein said dividing line separating said first zone and said second zone defines the closest permissable approach to the said base located in said second zone prior to said pitcher pitching said ball to said batter on each occasion that said batter strikes the ball, such that said fielder will be positioned outside said second zone until said pitcher pitches said ball to said batter on each occasion that said batter strikes the ball.

4,798,390

VOLLEYBALL SPIKING TEE

James E. Dooley, 3020 Minnesota Dr., #3, Anchorage, Ak. 99503

Filed Sep. 8, 1986, Ser. No. 905,063
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—411 **4 Claims**



1. A volleyball spiking tee for use in feeding a volleyball to a spike point, said tee comprising:

feed means for receiving and controllably discharging a volleyball; and

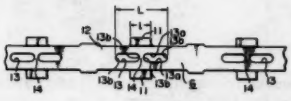
support means, coupled to said feed means, for supporting a volleyball discharged by said feed means, said support means comprising means for contacting a discharged volleyball at three points lying in a roughly horizontal plane and supporting the volleyball without obstructing a vertical plane passing through the center of the volleyball and extending below the volleyball.

4,798,391

THREE-PIECE OIL-RING WITH A SLOT

Yorishige Maeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 783,643, Oct. 3, 1985, abandoned. This application May 18, 1987, Ser. No. 51,169
Claims priority, application Japan, Dec. 28, 1984, 59-179390; Dec. 30, 1984, 59-180874
Int. Cl.[4] F16J *9/06, 9/20*
U.S. Cl. 277—139 **6 Claims**



1. A three-piece oil-ring for deposition in an oil-ring groove of a piston reciprocally positioned in a cylinder comprising:

a pair of axially spaced side rails;

an expander disposed between said side rails to expand said side rails, said expander extending in a circumferential direction and having waves in a radial direction, said expander including radially inner portions, radially outer portions, and radially intermediate portions extending between and connecting said radially inner and radially outer portions, each said radially inner portion including a substantially flat portion extending in the circumferential direction of said expander and curved portions connecting said substantially flat portion with adjacent radially intermediate portions, said radially intermediate portions being substantially flat so as to extend substantially straight between a said curved portion of a said radially inner portion and a said radially outer portion, said expander having paired side rail engaging portions integrally formed at axially opposite sides of radially inner portions of said waves so as to contact an inner side of said paired side rails, said side rail engaging portions being formed solely along said substantially flat portions of said radially inner portions, said expander also defining at least one slot in an axially central portion of said expander, solely in said radially inner portions of said waves, between at least one of said paired side rail engaging portions, such that radially outer portions of said waves are substantially imperforate, said paired side rail engaging portions having a circumferential length less than the circumferential length of said substantially flat portions of said radially inner portions and said slot having a circumferential length at least as great as the length of said substantially flat portions of said radially inner portions so as to provide a means for allowing each side rail engaging portion of said pair to move substantially freely, radially, relative to the other, said expander further having a rib extending from one side of said slot to the other side of said slot at a longitudinally central portion of said slot corresponding to said paired side rail engaging portions, at a ratio of a width of said rib to a thickness of said expander being between 1 and 3.

4,798,392

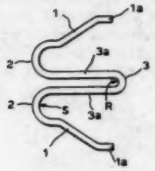
HOLLOW METALLIC SEALING RING

Michael J. C. Tozer, Northumberland, England, assignor to Heat Transfer Technology Ltd. (Jersey), Jersey, Channel Islands, Channel Islands

Continuation-in-part of Ser. No. 045,438, May 4, 1987, abandoned. This application Oct. 23, 1987, Ser. No. 112,315
Claims priority, application United Kingdom, Apr. 28, 1987, 8710042
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—200 **8 Claims**

1. A hollow metallic sealing ring of serpentine radial cross-

section, comprising of a pair of divergent limbs which are contiguous with a loop formation having at least one straight-sided loop, wherein the transition curve between the sides of



said loop and said divergent limbs being of constant radius, and wherein the free ends of said limbs being straight and substantially parallel.

4,798,393

RIDER-CONTROLLED WORKING MACHINE WITH FOUR-WHEEL STEERING SYSTEM

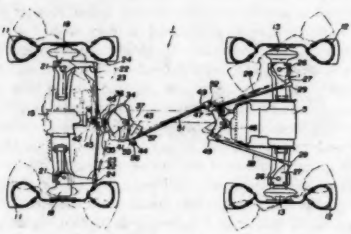
Tatsuhiko Miura, and Hiroshi Uno, both of Saitama, Japan, assignors to Hosda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 767,861, Aug. 21, 1985, Pat. No. 4,613,009, and a continuation of Ser. No. 811,727, Dec. 20, 1985, abandoned

Claims priority, application Japan, Dec. 20, 1984, 59-268786; Dec. 20, 1984, 59-268787; Dec. 20, 1984, 59-268788; Dec. 20, 1984, 59-193381[U]; Dec. 20, 1984, 59-193382[U]; Dec. 20, 1984, 59-193383[U]

Int. Cl.[4] B62D *3/02*

U.S. Cl. 280—91 **13 Claims**



1. A rider-controlled working machine with an earth working unit coupled thereto, comprising:

a steering wheel;

front wheels and rear wheels, said front and rear wheels having respective axles and said axles having longitudinal axes extending transversely of said working machine;

a steering link mechanism operatively interconnecting said steering wheel and said front wheel and rear wheels for steering the front and rear wheels simultaneously such that said rear wheels are steered in a direction opposite to that in which front wheels are steered when the steering wheel is turned through a relatively large angle, and said rear wheels are either not steered or steered in the same direction as that in which the front wheels are steered once said steering wheel is turned through a relatively small angle;

said steering link mechanism including steering means for steering those of said front and rear wheels which are closer to the earth working unit so that when said steering wheel is turned through the relatively large angle, the center of turning movement of the working machine is positioned between said longitudinal axes of the axles of said front and rear wheels, and when said steering wheel is turned through the relatively small angle, the center of turning movement of the working machine is positioned between an extension of a transverse axis of said earth working unit and the longitudinal axis of said axis of said those wheels, whereby said earth working unit is prevented from meandering while said working machine is moving substantially along a straight path; and

said steering means comprising a crankshaft having an eccentric first pivot portion and a second pivot portion operatively coupled to said those wheels and the other wheels, respectively, and a planetary gear mechanism cooperating with said crankshaft to define movements of the crankshaft.

4,798,394

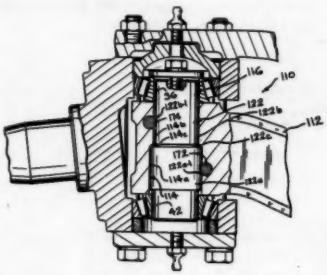
KINGPIN ASSEMBLY FOR A VEHICLE STEERING AXLE

Paul R. Pollock, and Larry P. Stoneburner, both of Fort Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Oct. 15, 1986, Ser. No. 919,888

Int. Cl.[4] B62D *7/18*

U.S. Cl. 280—96.1 **29 Claims**



12. A steerable axle assembly comprising:

an axle member including a bore extending therethrough, said bore having a surface extending between a bottom and a top of said axle member;

a kingpin including an intermediate portion having a surface, said kingpin being positioned in said bore of said axle member in at least partial surface-to-surface contact therewith;

a steering knuckle having a wheel carrying spindle portion and an upper yoke arm, said upper yoke arm having an aperture formed therethrough which surrounds at least a part of said kingpin; and

a steering arm including an end portion, said end portion of said steering arm being attached to said upper yoke arm of said steering knuckle to cover said aperture.

26. A steerable axle assembly comprising:

an axle member including a bore extending therethrough, said bore having an upper cylindrical portion defining a first diameter and a lower cylindrical portion defining a second diameter, said second diameter being larger than said first diameter so as to define a shoulder extending about said bore between said upper and lower portions;

a kingpin including an upper cylindrical end defining a first diameter and a lower cylindrical end defining a second diameter, said second diameter being larger than said first diameter so as to define a shoulder extending about said kingpin between said upper and lower ends, said shoulder of said kingpin engaging said shoulder of said bore to prevent upward movement of said kingpin within said bore; and

means for preventing relative rotational movement between said kingpin and said axle.

4,798,395

CYCLE APPARATUS HAVING THERAPEUTIC AND UTILITY ASPECTS

Don T. Shaffer, 5968 Culzean Dr., Apts. 1620, Trotwood, Ohio 45426, and Emmert Milyard, Box 11, Brookville, Ohio 45309

Division of Ser. No. 618,193, Jun. 7, 1984, Pat. No. 4,619,462. This application Aug. 18, 1986, Ser. No. 897,383

Int. Cl.[4] B62M 1/14

U.S. Cl. 280—240 12 Claims

1. An exercising, recreational and utilitarian apparatus comprising a mobile chassis having forward and rearward ends referenced to a normal direction of motion, a chassis mounted support for mid and upper portions of the body of a person using the apparatus, means for positioning said support in said chassis in an inclined attitude of use in which a forward end thereof is elevated relative to a rearward end, a substantially forwardly facing seat at the rearward end of said support, a substantially upwardly facing body rest member on said support forwardly of said seat, a person using the apparatus straddling said support and inclining forwardly with a mid body section resting on said body rest member and said seat backing up buttock body portions, and apparatus controls accessible to the hands of a person so situated, wheels supporting said chassis, said wheels being disposed so that one portion thereof is in a longitudinally spaced relation to another, one of said wheels including a portion thereof supported on and in connection with a shaft bearing for rotation in and relative to bearing support means in connection with said chassis, control means for said portion of said one wheel, said control means including hand operable lever means at least a portion of which is mounted for rotation on and relative to said chassis adjacent and forwardly of said body support, said lever means being operatively connected to said shaft for drive thereof and said portion of said one wheel thereby to effect a propulsion of said chassis.

10. An exercising, recreational and utilitarian apparatus comprising a mobile chassis having forward and rearward ends referenced to a normal direction of motion, a chassis mounted support for mid and upper portions of the body of a person using the apparatus, means for positioning said support in said chassis in an inclined attitude of use in which a forward end thereof is elevated relative to a rearward end, a substantially forwardly facing seat at the rearward end of said support, a substantially upwardly facing body rest member on said support forwardly of said seat, a person using the apparatus straddling said support and inclining forwardly with a mid body section resting on said body rest member and said seat backing up buttock body portions, and apparatus controls accessible to the hands of a person so situated, said support including a relatively extensible portion mounting said seat, and means for extending and retracting said extensible portion to set and reset said seat more distant from and more closely to said body rest member according to the requirements of a user.

4,798,396

WHEEL SUSPENSION SYSTEM FOR AUTOMOBILES

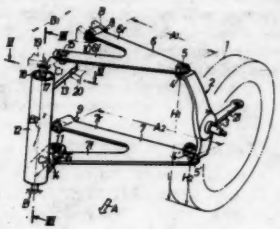
Masaaki Minakawa, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1987, Ser. No. 65,731

Claims priority, application Japan, Jun. 27, 1986, 61-151130; Feb. 5, 1987, 62-25102

Int. Cl.[4] B60G 3/00

U.S. Cl. 280—673 7 Claims



1. A wheel suspension system for an automobile, comprising:

a pair of upper and lower control arms each having a leading end and a base end, the leading ends of the control arms being connected to a knuckle carrying a vehicle wheel;

a pivot shaft fixedly supported on a vehicle body;

a support shaft rotatably supported on said pivot shaft by elastic members;

a pair of upper and lower support arms projecting from respective upper and lower portions of said support shaft, wherein the base ends of said control arms are each diverged into front and rear arm portions spaced apart from each other in a longitudinal direction of the vehicle body, such that one of the front and rear arm portions of said base ends are vertically swingably pivoted to the vehicle body, while the other of said front and rear arm portions of the base ends of the control arms are connected to said pair of upper and lower support arms.

4,798,397

VEHICLE SUSPENSION MECHANISM

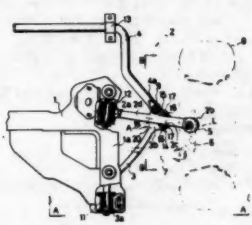
Katsuyuki Komiya, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed May 26, 1987, Ser. No. 53,745

Claims priority, application Japan, May 27, 1986, 61-80578

Int. Cl.[4] B60G 7/00, 3/00

U.S. Cl. 280—690 7 Claims



5. In a vehicle suspension mechanism including a lower arm, an assist link, a control link and a stabilizer, said lower arm comprising an elongated arm symmetrical about a longitudinal axis, a rubber bushing fixed to one end of said elongated arm and defining a pivoting axis transverse to said longitudinal axis of said elongated arm, a ball joint fixed to the other end of said arm, a mid-portion of said elongated arm defining a pair of

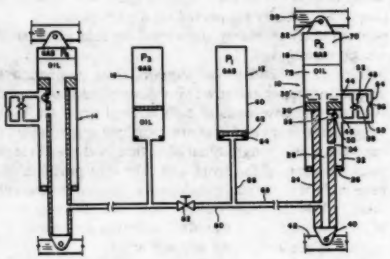
projections disposed on opposite sides of said longitudinal axis, said pair of projections being symmetrically shaped and disposed relative to said longitudinal axis, and said elongated arm defining at least three bores, two bores being symmetrically defined in said pair of projections and a third bore defined coincident with said longitudinal axis and longitudinally spaced from said two bores, said assist link comprising an elongated link, a rubber bushing fixed to one end of said assist link, the other end of said assist link defining at least three through bores spatially disposed to align and register with the at least three bores defined in said lower arm, and fastening means cooperating with said bores for fastening said lower arm and assist link together, said control link being formed with an elongated rod portion extending substantially perpendicular to said lower arm and connected to said lower arm at one end and to said stabilizer at the other end, and said stabilizer comprising an arcuate rod connected at an end portion to said other end of said control link at a substantially right angle.

4,798,398

DUAL RATE EQUALIZER SUSPENSION

Nolan W. Cummins, Bristow, Okla., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Filed Aug. 12, 1987, Ser. No. 84,681
Int. Cl.[4] B60G 11/26
U.S. Cl. 280—708 8 Claims



1. A suspension strut for a vehicle having a frame and an axle which comprises:

a housing having a closed end and connectable at the closed end to said frame, the other end of said housing having an opening;

a plunger extending through said opening, an axial passage extending axially within said plunger;

a piston connected to the end of said plunger which is in said housing, said piston having a passage therethrough which is aligned with the passage of said plunger;

a first and second orifice in the wall of said plunger and a check valve in one of said orifices;

a first and second orifice longitudinally spaced apart and in the wall of said housing;

a first bypass conduit means connecting said first and second housing orifices;

a second bypass conduit means connecting the first and second housing orifices;

an orifice in one of said bypass conduits;

a check valve in one of said bypass conduits.

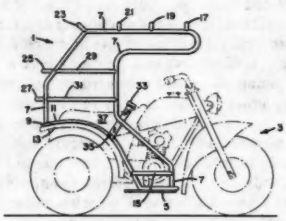
4,798,399

COMBINATION SAFETY CAGE FOR ALL TERRAIN VEHICLE

William M. Cameron, Rte. 4, Box 320, Florence, S.C. 29501

Filed Apr. 18, 1988, Ser. No. 182,415
Int. Cl.[4] B60R 22/00, 27/00
U.S. Cl. 280—756 4 Claims

1. A combination safety cage for attachment to support structure of and for use with an all terrain vehicle (ATV) to contain and keep the driver of the ATV physically and totally within said safety cage, to prevent the driver, in the event the ATV overturns or rolls over, from being thrown out of the ATV, to prevent the driver from sustaining bodily injury regardless of the direction the ATV overturns or rolls over, or in the event the ATV collides with a fixed object, to physically prevent the driver from putting either of his feet on the ground to get caught by a moving rear wheel of the moving ATV, and to lower the center of gravity of the ATV to improve its operational stability; said combination safety cage comprising a heavy bottom plate, side and head rails, wheel guards, horizontal rails, top overhead rails, rear horizontal rails, laterally projecting rails and a seat belt; said heavy bottom plate being disposed in transverse relationship with respect to said ATV, said heavy bottom plate lowering the center of gravity of said ATV to improve its operational stability, said side and head rails being serpentine-shaped, and having front portions, top-most portions and rearward portions, said front portions of said side and head rails being upstanding from said bottom plate, said top-most portions of said side and head rails extending rearwardly from said upstanding front portions of said side and head rails, said rearward portions of said side and head rails depending downwardly from said top-most portions of said side and head rails, said ATV having rear-wheel fenders, said

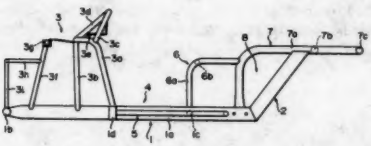


wheel guards extending rearwardly from said side and head rails, and over said ATV's rear-wheel fenders, said upstanding front portions of said side and head rails and said wheel guards carrying therebetween said horizontal rails, said top-most portions of said side and head rails carrying said top overhead rails therebetween, said downwardly depending rearward portions of said side and head rails carrying said rear horizontal rails therebetween, said downwardly depending rearward portions of said side and head rails and said upstanding front portions of said side and head rails carrying said laterally projecting rails therebetween, said bottom plate, upstanding front portions of said side and head rails, wheel guards and horizontal rails physically preventing the ATV driver from putting either of his feet on the ground to get caught by a moving rear wheel of said moving ATV, said ATV having a seat, said seat belt having remote ends, said safety cage carrying said seat-belt remote ends, said seat belt harnessing the driver to said ATV seat to contain and keep the driver physically and totally within said safety cage to prevent the driver, in the event the moving ATV overturns or rolls over, from being thrown out of the ATV, to protect the driver from bodily injury regardless of the direction in which the ATV overturns or rolls over, and to protect the driver in the event the ATV collides with a fixed object.

4,798,400
LIGHT-WEIGHT AND STRONG VEHICLE FRAME FOR A FOUR WHEELED BUGGY OPERATED BY A SEATED DRIVER

Hideyoshi Kosuga, Hyogo, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Jul. 2, 1987, Ser. No. 69,238
Claims priority, application Japan, Jul. 11, 1986, 61-163322
Int. Cl.[4] B62D 21/02
U.S. Cl. 280—796 2 Claims

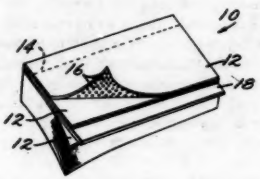


1. A vehicle frame for a four wheeled buggy having a steering wheel to be operated by a seated driver comprising:
a generally flat main frame having a narrower front portion;
a support frame for providing a steering apparatus, disposed upright on the front part of said main frame;
a flat floor frame portion situated behind said support frame;
a pair of step frames fixed horizontally to said main frame on each side of said floor frame;
a seat frame fixed upright to said main frame behind said floor frame;
a propulsion apparatus support frame connected to said seat frame and fixed upright to a rear end of said main frame behind said seat frame;
an oblique frame connected to an upper intermediate portion of said engine supporting frame and to the rear end of said main frame; and
an accommodating space for accommodating propulsion apparatus, said space situated below said propulsion apparatus support frame and said seat frame.

4,798,401
MULTIPLE COPY NOTE PAD

Walter G. Greig, Lewiston, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Mar. 5, 1987, Ser. No. 29,710
Int. Cl.[4] B41L 1/20, 1/24; B42D 9/00; B32B 7/06
U.S. Cl. 282—9 R 19 Claims

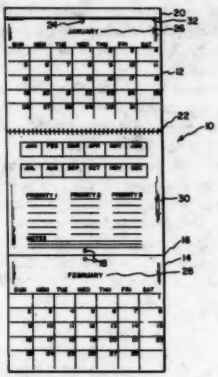


1. A multiple copy pad comprising:
a plurality of sheets arranged in a stack for receiving a writing;
an image transfer system arranged between each of the plurality of sheets for transferring a writing on one of said sheets to another of said sheets; and
a divider means, inserted underneath a selected number of said plurality of sheets, for blocking transfer of an image to a remaining number of said plurality of sheets thereunder;
wherein at least each of said plurality of sheets has a side with a repositionable adhesive strip means for maintaining the stack together.

4,798,402
PRIORITY PLANNER CALENDAR

Joseph M. Pazical, 105 Forliview Rd., Pittsburgh, Pa. 15116

Filed Aug. 22, 1986, Ser. No. 899,238
Int. Cl.[4] G09D 3/04; B42D 5/04
U.S. Cl. 283—2 6 Claims

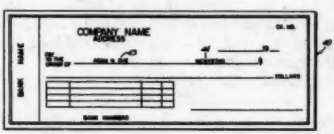


1. A calendar comprising a bound collection of leaves containing a plurality of double length leaves, each double length leaf having a display of an entire calendar month contained within one-half the surface area thereof, each double length leaf being attached at one of its ends to an interleaf binding, each double length leaf being, in a first position thereof, detachably attached at the other of its ends to said interleaf binding wherein said double length leaf is folded in half, whereby each double length leaf may be repositioned, from said first position to a second position, in which second position each double length leaf is attached to said interleaf binding by only one of its ends and in which second position each double length leaf is positioned above said interleaf binding in an unfolded position, and further whereby the same display of said entire calendar month remains visible in entirety when said double length leaf is positioned in either said first position or said second position.

4,798,403
PERSONAL IDENTIFICATION METHOD

Frederic P. Nelson, 17 S. First St., Apartment 1402A, Minneapolis, Minn. 55401

Continuation of Ser. No. 705,205, Feb. 25, 1985, abandoned.
This application Sep. 24, 1987, Ser. No. 100,605
Int. Cl.[4] G06K 3/00, 5/00; B42D 15/00
U.S. Cl. 283—70 2 Claims



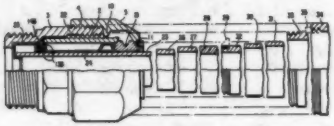
1. A method of verifying the identity of an authorized person in possession of a valuable document without necessarily alerting such person to the happening of such verification procedure, the method including the steps of:

(a) developing a coding system whereby observable personal characteristics of persons and descriptions of accessories worn, used or carried by such persons can each be reduced to a readable form which will be unintelligible to persons not having access to the coding system;
(b) obtaining, as a result of visual obaervation, information about a person who is to be authorized to process a valuable document, such information relating to observable characteristics of such person and to accessories worn, used or carried by the person;
(c) using the coding system, encoding such obtained information in such readable, nominally unintelligible form and entering said encoded information onto the valuable document before giving possession of the document to such authorized person;
(d) providing access to the coding system to all individuals who may have occasion to verify as to whether the person in possession of such encoded valuable document is the authorized person;
(e) scrutinizing each person presenting the valuable document to one of such individuals and comparing that person's observed characteristics and accessories with the personal characteristics and described accessories as indicated in coded form on the document; and
(f) challenging any person possessing the document who cannot be verified as being the authorized person.

4,798,404
PIPE COUPLING

Andrzej T. Iyanicki, Östrandsvägen 72, S-122 43 Enskede, Sweden

PCT No. PCT/SE83/00288, § 371 Date Mar. 23, 1984, § 102(e) Date Mar. 23, 1984, PCT Pub. No. WO84/00796, PCT Pub. Date Mar. 1, 1984
PCT Filed Aug. 11, 1983, Ser. No. 598,327
Claims priority, application Sweden, Aug. 11, 1982, 8204648
Int. Cl.[4] F16L *19/06*
U.S. Cl. 285—12 1 Claim

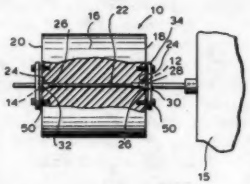


1. A pipe coupling comprising:
(a) a coupling housing (3) having:
(i) a first axial end and a second axial end;
(ii) a stepped axial bore comprising a small diameter portion opening at the first axial end of said coupling housing and a large diameter portion opening at the second axial end of said coupling housing;
(iii) internal threads (2) in said large diameter portion of said stepped axial bore; and
(iv) external threads (4) at the second axial end of said coupling housing (3);
(b) a guide and sealing ring (22) having a first axial end which, in use, bears against an elastic seal (13B) which in turn bears against the step (14B) in said stepped axial bore in said coupling housing (3) and a second axial end;
(c) a first clamping ring (21) having:
(i) a through bore which, in use, receives a pipe;
(ii) a first axial end which, in use, bears against the second axial end of said guide and sealing ring (22);
(iii) a second axial end; and
(iv) an external annular sloping guide surface at the second end of said first clamping ring (21), said external annular sloping guide surface tapering from a larger diameter in the direction of the first axial end of said first clamping ring (21) to a smaller diameter in the direction of the second axial end of said first clamping ring (21); and
(d) a coupling member (5) having an axial through passageway and comprising:
(i) a first portion having internal threads sized, shaped, and position to engage the external threads (4) on said coupling housing (3);
(ii) a first radially inwardly projecting annular flange sized, shaped, and positioned to bear against the second axial end of said coupling housing (3); and
(iii) a second radially inwardly projecting annular flange (10) sized, shaped, and positioned to bear against the external annular sloping guide surface at the second axial end of said first clamping ring (21).

4,798,405
ASSEMBLY FOR ELECTRICALLY NON-CONDUCTIVELY INTERCONNECTING TUBE ENDS

Clarence C. Hon, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 22, 1987, Ser. No. 99,853
Int. Cl.[4] F16L *19/00*
U.S. Cl. 285—53 6 Claims



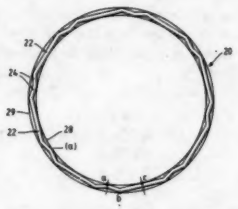
1. Connector assembly for electrically nonconductively interconnecting electrically conductive tube ends in a high pressure fluid flow circuit, said assembly comprising:
a block of electrically non-conductive material defining an electrically insulative barrier between the electrically conductive tube ends, said block having opposed end faces and a through bore extending between said end faces, said through bore at the ends thereof including enlarged entrant sections for receiving the electrically conductive tube ends, the bore run between the entrant sections being of substantially uniform diameter in correspondence to the inner diameter of the tube ends;
ferrules of a deformable material and having a tapered external body part closely encircling the electrically conductive tube ends, the ferrule tapered body parts being closely fittable with companion tapered surfaces in said bore entrant sections; and
force applying means mounted to the block end faces and movably engageable against the ferrules for urging said ferrules axially inwardly in the block entrant sections to compressively deform the ferrules against the electrically conductive tubes and the block companion tapered surfaces and thereby create an electrically non-conducting high pressure resistant fluid seal at the bore entrant sections, said force applying means being mounted to the block end faces at plural individual locations thereon to uniformly distribute at corresponding individual plural locations on said block end faces, the reactive loading applied to the block structure during force application to the ferrules.

4,798,406

MODIFIED FRICTION LOCKING RING

Michael J. Buller, Herts, England, assignor to Rolls-Royce plc, London, England

Filed Aug. 18, 1987, Ser. No. 86,474
Claims priority, application United Kingdom, Sep. 10, 1986, 8621739
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—320 8 Claims



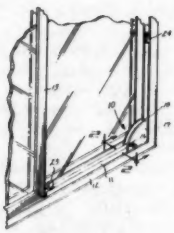
1. A locking member for insertion into a radial gap between radially inner and outer components which are fixed relative to each other and which rotate together for the purpose of restricting relative rotational movement between the components, said member comprising a plurality of levers located around an axis of rotation of the components, each lever having a first and a second limb, one of which is at an angle relative to the other and thereby defines a fulcrum at the intersection of the two limbs, said fulcrum of each lever being positioned so that, in use, it contacts an inner facing circumferential surface of the outer component, and said limbs being shaped so that, in use they contact an outward facing circumferential surface of the inner component at circumferentially spaced regions between the fulcrums, the product of the mass of the first limb of each lever with its moment about the respective fulcrum being greater than the corresponding product for the second limb of each lever so that, in use, centrifugal forces acting on each first limb cause the levers to rock about their respective fulcrums and thereby urge the second limbs radially inwards into engagement with the inner component.

4,798,407

SLIDING GLASS DOOR LATCH BAR

Richard A. Miller, Box 253-1 Rte. 4, Fort Atkinson, Wis. 53538

Filed Sep. 25, 1987, Ser. No. 101,270
Int. Cl.[4] E05C *3/04*
U.S. Cl. 292—229 2 Claims



1. A sliding glass door latch bar mechanism for use in combination with a sliding glass door and a stationary glass door relatively movable to one another within a perimeter framework wherein said latch bar mechanism comprises,

a latch bar including a first and second end, and

a pivotal means securing said first end within an upstanding framework, and

a locking mechanism positioned within said framework proximate said first end, and

a biasing means positioned between said framework and proximate said first end of said latch bar to bias said latch bar upwardly, wherein said latch bar is securable in a first horizontal position against the biasing force of said biasing means and secured and positioned by means of said locking mechanism, and

said latch bar securable in a second vertical position by a second "U" shaped biasing means comprising spaced spring fingers for receiving said latch bar to define a "U" shape, and

wherein said framework includes a pair of vertically positioned upstanding flanges positioned on either side of said latch bar, and

wherein a locking projection of a lesser width than said latch bar is positioned proximate said second end of said latch bar to cooperate with said spring clip to secure said latch bar in a second vertical position, and

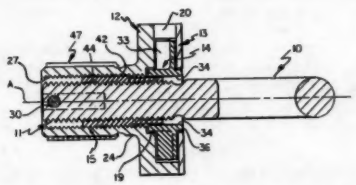
said locking mechanism includes a pivotal latch lever means formed with a first pivoted end extending through and exteriorly of one of said flanges in a first position and extending interiorly of said flanges formed with a second end to selectively abut an upper surface of said latch bar in said first horizontal position, and said latch lever means operative to disengage said surface to release said latch bar upon pivoting said first pivotal end to a second position.

4,798,408

ADJUSTABLE LATCHING MECHANISM

Raymond E. Harmon, Orange; William R. E. McCown, Montclair, and Frank A. Zankich, San Pedro, all of Calif., assignors to Rexnord Inc., Brookfield, Wis.

Continuation of Ser. No. 854,978, Apr. 23, 1986, abandoned.
This application Sep. 4, 1987, Ser. No. 93,307
Int. Cl.[4] E05C *21/02*
U.S. Cl. 292—341.18 16 Claims



1. An adjustable latching mechanism constructed and arranged for securing a first structure relative to a second structure, said mechanism comprising:

a connecting element for joining a first structure to a second structure, said connecting element having a portion with threads thereon;

an assembly for adjusting the position of said connecting element relative to the structures;

said assembly including a rotatable element tool-operable for rotation about an axis, a fixture constructed and arranged for securement to one of the structures, said fixture having a first portion containing a threaded through-hole therein of pre-determined length and diameter, and a second portion, forward of said first portion, constructed and arranged to contain said rotatable element in a manner permitting a pre-determined range of movement along said axis, said rotatable element having a central portion with a through-hole therein,

said assembly further including means, separate from said rotatable element, for translating rotational movement of said rotatable element into linear movement of said connecting element, said means including a first forward portion constructed and arranged for interfitting mounting in said rotatable element through-hole, a second rearward portion having outer threads permitting threaded

engagement within said fixture threaded through-hole, and a threaded through-hole of a size permitting threaded engagement of said connecting element threaded portion therein; and

means for preventing rotational movement of said connecting element within said assembly as said rotatable element is rotated.

4,798,409

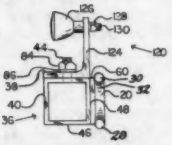
VEHICLE BUMPER, ACCESSORIES ATTACHABLE THERETO AND COMBINATION

Robert Miller, 67-A Greenpond Rd., Sherman, Conn. 06784

Filed Oct. 6, 1986, Ser. No. 915,402

Int. Cl.[4] B60R *19/48, 9/00*

U.S. Cl. 293—117 **6 Claims**



1. In combination, a supplemental bumper attached to a pre-existing bumper of a vehicle, and an accessory releasably attached to said supplemental bumper, said supplemental bumper comprising a generally rectangular bumper face facing upwardly, and first and second accessory engaging means including first and second generally cylindrical surfaces, respectively, interrupting said bumper face and spaced from each other longitudinally of said bumper face, and said accessory comprising a base plate having a generally rectangular base plate face overlapping said bumper face, and first and second bumper engaging means including first and second generally cylindrical surfaces, respectively, interrupting said base plate face and spaced from each other longitudinally of said first base plate face, said cylindrical surfaces of one said engaging means being provided by studs projecting from the face interrupted thereby, and said cylindrical surfaces of the other said engaging means being provided by holes in communication with the face interrupted thereby, said studs being located in said holes.

4,798,410

LIFTING SLIDING ROOF FOR VEHICLES

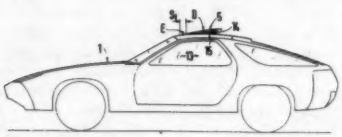
Klaus Weller, Bopfingen; Walter Braun, Sindelfingen, and Harry Nennemann, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 15, 1987, Ser. No. 108,647

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636029

Int. Cl.[4] B60J *7/047, 7/22*

U.S. Cl. 296—217 **18 Claims**



1. A lifting sliding roof for vehicles comprising:

a vehicle roof;

a cover means for selectively closing and at least partially exposing a roof opening in said vehicle roof;

a rear edge means of said cover means being tiltable vertically from said roof opening to create lateral side air gaps and a rear air gap between said cover means and said roof opening; said cover means being slidable from a tilted position adjacent a front edge of said roof opening toward the rear of the vehicle to create a front air gap between said cover means and said front edge of said roof opening to allow air flow into said vehicle;

sealing frame means movable into abutment with said cover means for preventing air flow through said lateral side and rear air gaps into said vehicle while allowing air to flow through said front air gap into said vehicle when said cover means is both vertically tilted and slid away from said front edge of said roof opening; and

said sealing frame means being retractable out of abutment with said cover means to allow air flow through said lateral side and rear gaps when said cover means is only vertically tilted.

4,798,411

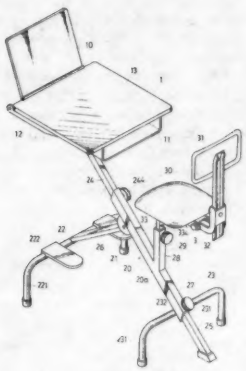
COLLAPSIBLE COMBINED TABLE AND CHAIR ASSEMBLY

Pao C. Lin, No. 35, Lane 221, Sung-Chiang St., San-Min District, Kaohsiung City, Taiwan

Filed Jul. 8, 1987, Ser. No. 71,219

Int. Cl.[4] A47B *83/02*

U.S. Cl. 297—170 **14 Claims**



1. A collapsible combined table and chair assembly comprising:

a front U-shaped support having a front transverse rod and two front legs;

a rear U-shaped support having a rear transverse rod and two rear legs;

a telescopic strut having a lower end portion connected fixedly to said rear transverse rod and extending upwardly and forwardly to an upper end portion thereof, said telescopic strut further having an upstanding support extending from said telescopic strut between said upper and lower end portions;

a first strut having a lower end fixed to said front transverse rod, and an upper end hinged to said telescopic strut;

a plate bracket of substantially U-shaped cross-section which has a base plate portion secured to said telescopic strut at a location higher than that at which said upstanding support is located and including two parallel flanks at opposite sides of the base plate to confine a space for receiving and to serve as supports for hinging said first strut at a first pivot axis;

a locking means for preventing said upper end of said first strut from pivoting relative to said telescopic strut;

a table unit connected hingedly to said upper end portion of said telescopic strut; and

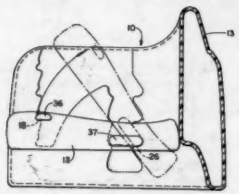
a chair unit connected hingedly to said upstanding support.

4,798,412

TWO PIECE BOOSTER SEAT WITH MULTIPLE SEAT HEIGHTS

Louis M. Kohus, and John V. Mariol, both of Cincinnati, Ohio, assignors to KohusMariol, Inc., Cincinnati, Ohio

Filed Dec. 21, 1987, Ser. No. 136,136
Int. Cl.[4] A47D 1/10
U.S. Cl. 297—250 **15 Claims**



1. A booster seat for accommodating a child in one of a plurality of selected height positions, comprising:

(a) an open-sided base with side and back supports, each side support having a forward channel with a set of vertically spaced substantially level ledges and a back channel with a set of vertically spaced substantially level ledges, each ledge of said forward set of ledges vertically offset from each corresponding ledge in the back set of ledges; and

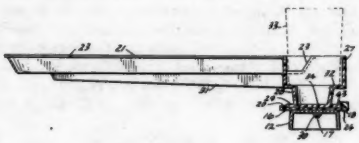
(b) a removable seat piece dimensioned to fit in the open-sided base and rest on the forward and back set of ledges in a substantially horizontal position, wherein each side of the seat piece has a forward protrusion and a back protrusion vertically offset from one another, each of said back protrusions dimensioned to slide in the back channels of the open-sided base when said seat piece is held in a plane substantially perpendicular to the horizontal until a ledge at a selected height is reached whereupon pivotable movement of the seat piece towards a horizontal plane causes each back protrusion to rest upon the ledges at the selected height and each forward protrusion to move downwardly in the forward channels until each rests upon one of the ledges such that the seat piece is substantially horizontal and secured in the open-sided base at the selected height.

4,798,413

TRAY DEVICE

Edward J. Capelli, 7317 31st Ave., Kenosha, Wis. 53142

Continuation of Ser. No. 788,937, Oct. 17, 1985, abandoned. This application May 1, 1987, Ser. No. 48,514
Int. Cl.[4] A47C 7/62
U.S. Cl. 297—194 **10 Claims**



1. A tray device for attachment to a supporting structural member such as the arm of furniture:

a base member adapted to be connected to said supporting structural member;

a tray member;

said base member and said tray member including an undercut portion and a raised portion on one of said base or tray members and a flange for fitting between said undercut portion and said raised portion on the other of said base or tray member to provide a combined snap-fit and pivotal means arranged to permit the tray member to be interconnected to said base member in a swivel manner without substantial longitudinal movement with respect to said arm and any additional fastening elements; and

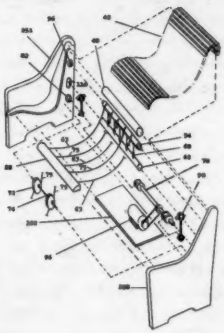
a hollow cup or glass receiving compartment extending oppositely from said flange member when said flange is placed between said undercut and raised portion.

4,798,414

PHYSIOTHERAPEUTIC CHAIR LIKE DEVICE

Vincent Hughes, 2022 18th Ave., San Francisco, Calif. 94116

Continuation-in-part of Ser. No. 2,787, Jan. 13, 1987, abandoned. This application Feb. 22, 1988, Ser. No. 161,352
Int. Cl.[4] A47C 7/46; A61H 7/00
U.S. Cl. 297—284 **9 Claims**



1. A physiotherapeutic chair-like device, comprising:

(a) left and right hand structural side support assemblies being vertical and parallel and containing curved channeled passage ways on their inside surfaces, and

(b) said structural side support assemblies being joined together by fixed transverse members whose ends are attached to the inside surface of the structural side support assemblies by screws or mortise and tenon joints, and

(c) an array of elastic tension cords, suspended from a transverse front fixed member or seat lip, said elastic tension cords running to the rear and upward in parallel are wrapped over a transverse roller shaft whose ends are journaled in ball bearings captured in the inside surface of the said left and right structural side support assemblies then said elastic tension cords running vertically downward and attached by end hooks to threaded eyes which pass through holes in a transverse tension shaft whose ends are captured and contained in vertical slots in the inside surfaces of the said left and right structural side support assemblies, said eyes having hex nuts or thumb nuts attached to their lower ends for means to adjust the tension in the said individual tension cords of the array, and

(d) a seat and back assembly composed of rigid elongated elements or bars, interconnected by means of, spherical beads and elastic elongated elements, so assembled for means of forming a plurality of articulated curved shapes, said seat and back assembly floating on and supported by said array of elastic tension cords underlying and located in the rear of the seat and back assembly, and

(e) said seat and back assembly in which the length of the bars being longer than the separation of the parallel structural side support assemblies allow the edges of the seat and back assembly to protrude into and be contained by

the channeled passage ways located on the inside surfaces of the left and right structural side support assemblies, and

(f) a plurality of oval shaped cams located in the rear and behind the lower back area of the seat and back assembly, said cams having pulley like grooves on one edge serving as guides for elastic tension cord passage and flat surface on other edge in contact with the rear of the seat and back assembly, the said cams being maintained in contact with the rear of the seat and back assembly by the individual tension cord of the said array on which they are mounted, and

(g) each said cam having a reverse curved passage way in the lower portion through which the cam mounted elastic tension cord is laced prior to attachment to the seat lip, the lacing arrangement of the elastic tension cord through the cam resulting in a force couple being set up within the cam which causes a torsional moment about the centroid of the cam rotating the cam against the rear of the seat and back assembly whereby providing a means for automatic curve shaping in the lower lumbar and part of the thorax section of the back in accordance with the weight and body bulk disposition of the occupant when the chair is used in the static mode, and

(h) said cams being joined together by two transverse, parallel members located on the major axis of the oval shaped cams forming a cam spool assembly whereby providing a means for the cams to act in unison, and

(i) said cam spool assembly having the ends of a plurality of elastic tension cords attached between the said upper transverse member and the seat lip whereby providing a means to supplement the automatic curve shaping by causing rotation of the cam spool assembly toward and against the rear of the seat and back assembly plus translational movement of the cam spool assembly when activated by the weight of the occupant, and

(j) said cams having one or more pivot holes in which a transverse elastic tension cord passes being perpendicular to the cams and the structural side support assemblies and secured to the structural side support assemblies by end hooks attached to eyes on the inside surfaces of the side support assemblies whereby providing means for the cams to rotate about the pivot and the said transverse elastic tension cord when the chair is used in the dynamic mode, the transverse elastic tension cord being disengaged from the side supports when the chair is used in the static mode, and

(k) a motor located within the chair and below the seat, said motor connected to a transverse crank shaft by a pulley and belt drive train, said crank shaft located above the motor and having its ends journaled in ball bearings located in the left and right structural sides, the crank shaft in turn connected to the said transverse tension shaft, located above the crank shaft, by connecting rod assemblies, said connecting rod assemblies located one at each end of the tension shaft, whereby providing a means to activate the tension shaft in a vertical, reciprocating motion which in turn causes up and down and forward and backward movement of the seat and back assembly by the alternate stretching and contracting of the tension cords working in combination with the rotating cams to produce passive exercise to the knee joints, hip joints, pelvic areas, back joints and shoulders.

4,798,415

DEVICE FOR ADJUSTING ELEVATIONAL POSITION OF HEAD REST

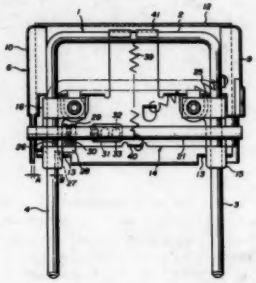
Masaharu Tanino, Toyota, and Takemi Hattori, Anjo, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisen Seiki Kabushiki Kaisha, both of, Japan

Filed Jan. 20, 1988, Ser. No. 146,185

Claims priority, application Japan, Jan. 26, 1987, 62-9506[U]

Int. Cl.[4] A47C 1/10

U.S. Cl. 297—410 **5 Claims**



1. A device for adjusting the elevational position of a head rest located on a seat back of a seat for a vehicle, said device comprising: a stay formed with a plurality of grooves along an elevational direction, and a locking mechanism mounted in a shell of the head rest for engaging or disengaging the grooves of the stay by means of lateral movements of the head rest, said stay having right and left vertical rods integrally coupled at the upper portions thereof to a lateral rod, a bracket member being provided in the shell and coupled with the two vertical rods of the stay through two cylindrical supporting members slidably supported on the two vertical rod of the stay, a rod penetrating laterally through the shell and the bracket member to b secured to the shell but movably engaged with the bracket member in such a manner that the shell is urged either leftward or rightward with respect to the bracket member with a gap formed at one side thereof, the grooves being formed in the vicinity of the bracket member on at least one vertical rod of the stay, a locking plate being formed in the vicinity of the bracket member and rotatably coupled with the rod to be urged toward engagement with any one of the grooves of the vertical rod of the stay, whereby an engaging distance between the locking plate and the groove is equal to or substantially smaller than the gap formed at one side thereof.

4,798,416

SEAT, PARTICULARLY A VEHICLE SEAT

Eberhard Faust, Stuttgart; Heinz Bossert, Holzgerlingen; Kurt Niethammer, Jettingen-U, and Otto Ohlhausen, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 72,169

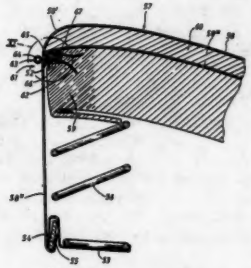
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623634

Int. Cl.[4] A49C 7/02

U.S. Cl. 297—452 **28 Claims**

1. A seat, particularly a vehicle seat, having a supporting frame; a spring system that is fastened at the supporting frame; an upholstered part having side edges and a dimensionally stable upholstery means arranged above the spring system; a cover means having an upper portion covering the upholstered part; said cover means having a lower portion fsatened with a first fastening means at said supporting frame, wherein it is tensioned at a border of the supporting frame for producing a spring preloading on the seat; the cover means having an

additional fastening means located above its first fastening means for fastening the upper portion of the cover means to the dimensionally stable upholstery means at a transition area between the upholstered part and the spring system to thereby define a junction of said upper and lower portions of the cover



means; and wherein the cover means in the transition area between the upholstered part and the spring system defines a preload force absorbing means for absorbing said spring preloading without allowing the force due to the spring loading to be applied to the upper portion of the cover means that surrounds said side edges of the upholstered part.

4,798,417

METHOD OF SEPARATING THE UPPER COAL IN SEAMS

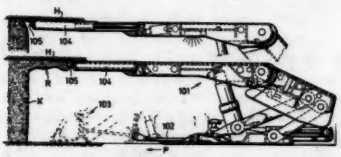
Günter Blumenthal, Herten-Westerholt; Gustav Neu, Bochum; Karl-Heinz Berger, Gelsenkirchen, and Siegmar Block, Essen, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhütte Heintzmann GmbH & Co. HG

Filed Sep. 14, 1987, Ser. No. 96,678

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3531069

Int. Cl.[4] E21D *23/16, 23/22*

U.S. Cl. 299—1 **5 Claims**



1. A method for separating the upper coal of a seam from the roof during the advancement of an upper sliding cap of a shield-type support frame, wherein a front edge of the cap is forced in a plane of the cap between the upper coal to be separated and the rock from which the coal is to be separated, and wherein the shield-type support frame is connected to a support conveyor through walking legs comprising moving the sliding cap backwardly and forwardly for several times during the advancement of the sliding cap, so that the cap is thrust between the upper coal and the rock during several successive advance movements of the cap and the steps of:

(a) determining the relative position between walking legs and sliding cap by means of distance sensors and an electronic circuit, and

(b1) if the determined relative position corresponds to a desired value or a desired value range, carrying out a distance synchronization between sliding cap and walking legs, or

(b2) if the determined relative position does not correspond to the desired value or the desired value range, carrying out a cyclical forward and backward movement of the sliding cap, wherein the cyclical forward and backward movement is effected by the electronic circuit.

4,798,418

VEHICLE WHEEL

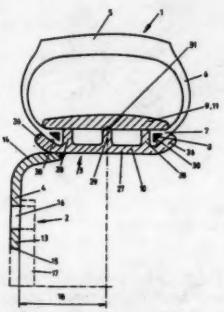
Helmut Kempf, Schaffhausen, and Hans Kopp, Uhwiesen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Mar. 5, 1987, Ser. No. 22,029

Claims priority, application Switzerland, Mar. 14, 1986, 1050/86

Int. Cl.[4] B60B *21/00, 21/10*

U.S. Cl. 301—31 **14 Claims**



1. A vehicle wheel for mounting of a pneumatic tire having tire beads, particularly for commercial vehicles, comprising:

a rim having an outer-situated rim part possessing a radially inner circumference against which bear the tire beads of the pneumatic tire;

said rim being provided with a respective groove for receiving an associated tire bead of the pneumatic tire;

said outer-situated rim part comprising an external, circumferentially closed ring,

said rim further including an internal rim ring cooperating with said external circumferentially closed ring;

said grooves being formed conjointly by said external circumferentially closed ring and said internal rim ring;

said external circumferentially closed ring being separate from but engaging said internal rim ring and being separately insertable into said pneumatic tire;

an attachment flange fixedly connected to said internal rim ring; and

said internal rim ring together with said attachment flange being circumferentially separated and comprising three segments.

4,798,419

ANTI-JACKNIFING VALVE

William E. Barnes, 317 Pier A Naples Land Yacht Harbor, Naples, Fla. 33962

Filed Jul. 27, 1987, Ser. No. 78,580

Int. Cl.[4] B60T *13/00*

U.S. Cl. 303—7 **3 Claims**

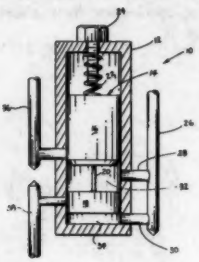
1. A new and improved braking systems for a tractor having a first set of brakes and a trailer towed thereby having a second set of brakes, said system being designed to prevent jackknifing between said tractor and said trailer and essentially comprising a valve means which facilitates a selective controlling of pressurization and flow of hydraulic braking fluid to said first and second set of brakes in an independent manner, whereby said second set of brakes is applied prior to an application of force to said first set of brakes, and

wherein said valve means includes a substantially fluid-tight

housing means having a brake fluid delivery conduit in fluid communication therewith, a first brake fluid outflow conduit communication therewith and operably controlling said first set of brakes, and

a second brake fluid outflow conduit in fluid communication therewith and operably controlling said second set of brakes, and

further including a piston means slidably retained within said housing means and being movable in response to fluid



pressure delivered through said brake fluid delivery conduit, said piston means serving to selectively open and close said first and second brake fluid outflow conduits, and

wherein said piston means includes a first piston head and a second piston head spaced therefrom and fixedly secured thereto, said first piston head serving to control a delivery of fluid to said first brake fluid outflow conduit and second piston head serving to control a delivery of fluid to said second brake fluid outflow conduit.

4,798,420

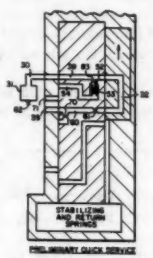
FLUID BRAKE CONTROL SYSTEM FOR RAILROAD VEHICLES

Walter E. Rojecki, Watertown, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Nov. 16, 1987, Ser. No. 121,378

Int. Cl.[4] B60T *17/04*

U.S. Cl. 303—38 **20 Claims**



1. A fluid pressure brake control system for a railway train having a normally charged brake pipe, a brake motor and a control valve device for each car of the train wherein the the control valve device has an improved service valve device comprising:

(a) service slide valve means having passages governing a first stage of quick service preliminarily effective upon sensing a pressure reduction in the brake pipe for venting fluid from the brake pipe to atmosphere through a quick service volume,

(b) said slide valve means having other passages governing a second stage of quick service effective when the service valve is in a service position for initially charging the brake motor from the brake pipe to a predetermined limited pressure,

(c) said slide valve means having still further passages governing a third stage of quick service effective when the service valve is in a service position for substantially continuously venting fluid from the brake pipe to atmosphere at a controlled rate comparable to a service rate of reduction in the brake pipe.

4,798,421

PLUNGER SYSTEM FOR MODULATING A BRAKE PRESSURE

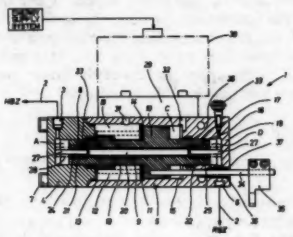
Wolfgang Bernhardt, Korntal, and Michael Tischer, Abstatt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1987, Ser. No. 106,831

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3638980

Int. Cl.[4] B60T *8/42*

U.S. Cl. 303—115 **23 Claims**



1. A plunger system in a brake line between a master brake cylinder and a wheel brake cylinder of a vehicle for modulating a brake pressure in the event of any danger, detected by a sensor, of locking or spinning of wheels of the vehicle which comprises, a housing, a blind bore in said housing, an end closure for said housing, a plunger axially displaceable in said blind bore, a first variable pressure chamber formed by an end of said plunger and said end closure and a second variable pressure chamber formed between an end of said plunger and said housing, said first variable pressure chamber having a connection with a master brake cylinder and said second variable pressure chamber having a connection with a wheel brake cylinder, an axial bore in said plunger, a rod fixedly secured within said axial bore between said housing end of said blind bore and said end enclosure, said rod having a diameter which is less than said axial bore and means for closing one end of said axial bore in the event of a danger of wheel locking, as well as in the event of impermissible drive slip whereby fluid flow from said master brake cylinder to said wheel brake cylinder is blocked.

4,798,422

HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Horst P. Becker, Frankfurt am Main, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,619

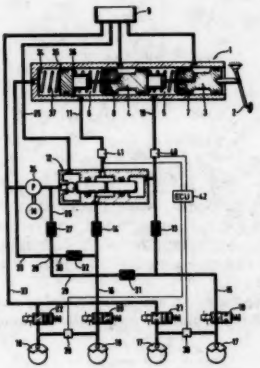
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622556

Int. Cl.[4] B60T *8/32*

U.S. Cl. 303—115 **1 Claim**

1. A hydraulic brake system for automotive vehicles, said system comprising a master brake cylinder directly operable

by a brake pedal, at least one wheel brake in communication with the master brake cylinder, a motor-driven pump capable of being connected or disconnected to the wheel brake, a brake valve for controlling the pump pressure, the brake valve being operable by pressure in the master brake cylinder, a brake skid control means comprising a valve arrangement coupled ahead of the wheel brake, said valve arrangement being operative so that the wheel brake can be connected to the pump or to a nonpressurized reservoir, wherein the pressure decrease in the wheel brake is effected by driving the valve arrangement, a bottom end of the master brake cylinder including a piston separating the master cylinder chamber from a reserve pressure chamber, means for connecting or disconnecting the reserve pressure chamber to the outlet of the pump, a fixed stop in said master cylinder for precluding the piston from moving into the master cylinder chamber, a check valve which blocks the return flow to the master brake cylinder, said check valve being provided in the outlet of the master brake cylinder leading to the wheel brake, pressure sensors for sensing pressure in the wheel brake and on the outlet of the master brake cylinder, and a control means provided to detect and compare the pressure values measured by the sensors and for pulsatedly driving a pressure relief valve of the valve arrangement to adapt the wheel brake pressure to the master cylinder pressure at a ratio predetermined by the brake valve.



4,798,423

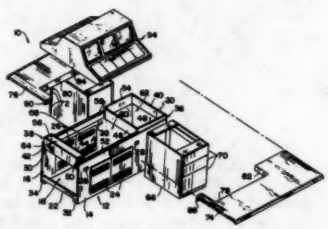
MODULAR DESK SYSTEM

Paul M. LaCour, Ridgewood, N.J., assignor to LaCour Incorporated, Ridgewood, N.J.

Continuation-in-part of Ser. No. 794,128, Nov. 1, 1985, abandoned. This application Jan. 7, 1987, Ser. No. 1,036

Int. Cl.[4] A47B *21/00*

U.S. Cl. 312—195 **30 Claims**



1. A desk system, comprising a core having an interior raceway, a substantially open top, a first face panel on one side of said core and a second face panel on an opposite side of said core; a first work top extending outwardly from said one side of said core, said first work top having an inner edge which is directly supported by said first face panel; a second work top extending outwardly from said opposite side of said core, said second work top having an inner edge which is directly supported by said second face panel such that said second work top is arranged in substantially back-to-back relationship with said first work top, whereby said first and second work tops define a pair of back-to-back work stations, said core being common to both of said work stations; first supporting means extending downwardly from said first work top for supporting an outer portion of said first work top; second supporting means extending downwardly from said second work top for supporting an outer portion of said second work top; and covering means for covering said top of said core, said covering means including a turret which is common to both of said work stations and which is partially sunk into said raceway through said top of said core, said turret including housing means for housing computer data monitors such that at least one of said computer data monitors faces one of said work stations and at least another of said computer data monitors faces the other of said work stations and such that each of said computer data monitors extends below said first and second work tops to thereby reduce the distance that said turret projects above said work tops.

4,798,424

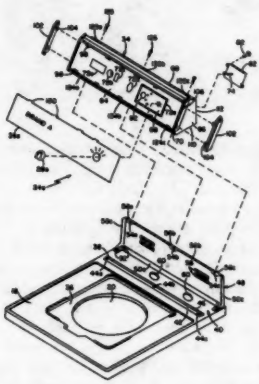
REVERSIBLE CONTROL CONSOLE

Donald A. Coates, Green Lake; Philip J. Manthei, and Max D. Allen, both of Ripon, all of Wis., assignors to Speed Queen Company, Ripon, Wis.

Filed Sep. 28, 1987, Ser. No. 101,475

Int. Cl.[4] D06F *1/02*

U.S. Cl. 312—257 R **10 Claims**



1. A control console housing adapted for mounting on an appliance top panel in first and second alternate orientations comprising:

a substantially rectangular control mounting panel having ends;

a pair of end panels connected perpendicular to respective ones of said ends of said control mounting panel, each of said end panels having a first edge for seating on the top said appliance top panel and supporting said control mounting panel in said first mounting orientation, each of said end panels further having a second edge for seating on the top said appliance top panel and supporting said control mounting panel in said second mounting orientation wherein said control mounting panel is inverted from

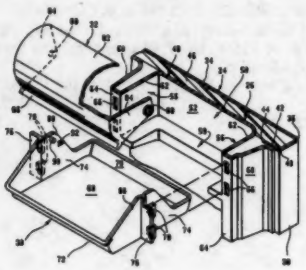
said first mounting orientation, said first and second edges having different angles with respect to said control mounting panel wherein said control mounting panel is supported at different angles with respect to said appliance top panel in said first and second orientations; and means for securing said housing to said appliance top panel in both said first and second mounting orientations.

4,798,425

COMPARTMENT ASSEMBLY FOR A REFRIGERATOR

William J. Armstrong, and Richard A. Stich, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Feb. 22, 1988, Ser. No. 158,717
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—328 8 Claims



1. A compartment assembly for a refrigerator comprising:

a panel on the inside of a refrigerator door, said panel having a recess area with a rear wall, a top wall and at least two spaced apart vertical dikes directed outwardly from the rear wall, said recess area having at the bottom thereof an inwardly projecting lip, said dikes having a side wall and a front face, said each front face having a slot,

a tray having a bottom walls and integrally formed rear wall, front wall, and side wall, said side walls each having a flange projecting outwardly perpendicular to the side walls, said flanges each having a rearwardly projecting hook shaped element parallel to the side walls, said tray having a length such that the hook shaped elements cooperate with the slots in the vertical dikes for engagement and a horizontal depth such that the front wall projects outwardly from the dikes and the rear wall extends to the rear wall of the recess and rests on the projecting lip, and

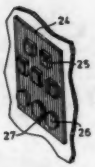
a removable cover having a body portion and end portions pivotly secured at the end portions to the side walls of the tray, said assembled tray and cover having a vertical height relative to the vertical height of the recess area between the projections lip and top wall less than the vertical distance necessity to withdraw the book shaped elements from engagement with the slots in the vertical dikes, whereby the hook shaped elements on the tray cannot be disengaged from the slots in the dike without first removing the cover from the tray.

4,798,426

HOLOGRAPHIC OPTICAL ELEMENT FOR INSTRUMENT PANEL DISPLAYS

Richard E. Malcolm, Oakville, and Frank Neuperger, St. Catherines, both of Canada, assignors to Astronautics Corporation of America, Milwaukee, Wis.

Continuation of Ser. No. 915,631, Oct. 6, 1986, abandoned. This application Dec. 22, 1987, Ser. No. 136,464
Claims priority, application Canada, Oct. 7, 1985, 492407
Int. Cl.[4] G02B *5/32*; G03H *1/22*
U.S. Cl. 350—3.7 17 Claims



1. A holographic optical system comprising:

a hologram superimposed with and positioned on or adjacent an existing instrument of an instrument panel and reflecting an image generated at a place other than said panel; and

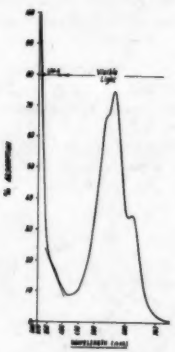
means for producing an image at a position away from the instrument panel and for projecting the image onto the hologram.

4,798,427

APPARATUS FOR USE IN SUNBATHING

John Sear, Coalville, England, assignor to Sevendart Limited, A Limited Company of U.K., Manchester, United Kingdom

Continuation of Ser. No. 640,882, Aug. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 439,539, Nov. 5, 1982, abandoned. This application Jun. 10, 1986, Ser. No. 872,648
Claims priority, application United Kingdom, Mar. 24, 1982, 8208633
Int. Cl.[4] G02B *5/22*; G21F *1/10*
U.S. Cl. 350—1.1 15 Claims



1. A radiation filter for use in sunbathing comprising: a screen of a plastic material; said plastic material being substantially transparent to the safe UV-A wavelengths of solar radiation and substantially transparent to visible wavelengths of solar radiation; said screen containing at least one first agent which absorbs at least 80% of incident solar UV-B radiation and at least one second agent which prevents transmittal of a biologically significant proportion of above 50% of incident

visible solar radiation and incident IR solar radiation of wavelength in the ranges 450 to 700 nm and 7000 to 15000 nm respectively through said screen;

said first agent and said second agent being substantially uniformly dispersed throughout said screen; said screen being transmissive of at least 80% of solar radiation in the UV-A wavelengths, and being transmissive of at least approximately 50% of incident visible and IR solar radiation

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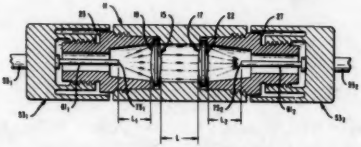
4,798,428

FIBER OPTIC COUPLING SYSTEM

Mohammad Karim, Kettering, Ohio, and Madhu C. Patel, Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 14, 1986, Ser. No. 918,744
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 **2 Claims**



1. A fiber optic coupling system for optically coupling a first fiber end of a first fiber optic cable, having a first core surrounded by a first cladding, to a second fiber end of a second fiber optic cable, having a second core substantially equal in diameter to the first core surrounded by a second cladding, said optical coupling system comprising:

a housing having first and second housing portions and first and second housing segments respectively disposed within said first and second housing portions;

a first connector for terminating said first fiber optic cable and adjustably connected to said first housing portion to enable said first fiber end of said first fiber optic cable to protrude into said first housing portion;

a second connector for terminating said second fiber optic cable and adjustably connected to said second housing portion to enable said second fiber end of said second fiber optic cable to protrude into said second housing portion,

a first biconvex lens having a first diameter and a second biconvex lens having a second diameter respectively supported face-to-face in said first and second housing segments;

said first fiber end is located within a first distance from said first lens, said first distance being determined as a function of the diameters of said core of said first fiber optic cable and said first lens;

said second fiber end is located within a second distance from said second lens to enable said second lens to converge all of the light passing through said second lens onto said second fiber end; and

said first lens substantially collimating diverging light transmitted from said first fiber end, said second lens substantially converging the substantially collimated light from said first lens onto said second fiber end to complete a light path between said first and second fiber optic cables.

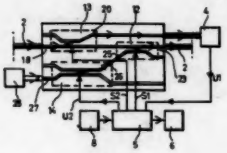
4,798,429

OPTOELECTRIC CONNECTION DEVICE

Anders G. Djupsjöbacka, Solna, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 17, 1985, Ser. No. 809,936
Claims priority, application Sweden, Feb. 11, 1985, 8500615
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.14 **9 Claims**

1. An optoelectric connection device for connecting transmission and reception means to a line for optical information transmission, said device comprising first and second directional couplers each having two respective inputs and outputs, said device having an input for a line and at last one reserve input both connected to the inputs of said first directional coupler, said device further having an output for the line and at least one reserve output both connected to the outputs of said second dirctional coupler, optical connection means between a



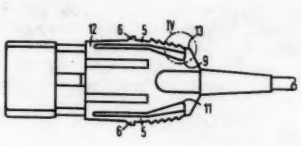
first output of the first directional coupler and a reception means and further optical connection means between a first input of the second directional coupler and a transmission means, a second output of the first directional coupler being optically connected to a second input of the second directional coupler and means for selectively enabling or disabling the directional couplers together or individually.

4,798,430

LIGHTWAVE GUIDE CONNECTOR WITH RELEASE LEVERS

Alfred H. Johnson, Poughkeepsie, N.Y.; Peter Pohl, Krailling, Fed. Rep. of Germany; Heinz Prauer, and Dietmar Schulz, both of Munich, Fed. Rep. of Germany, assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany and IBM, Armonk, N.Y.

Filed Jun. 8, 1987, Ser. No. 58,974
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **1 Claim**



1. A connector for lightwave guides having a connector casing and connector counterparts, said casing having narrow sides and having attached at the narrow sides of the connector casing spring-loaded release levers which actuate detents which are released from a locking plate of said counterparts when lateral pressure is applied on the release levers and which are engaged with said locking plate in a plugged position of said connector casing in the connector counterparts when the connector casing is connected to said counterparts, the improvement comprising:

said narrow sides of said connector casing having recesses therein;

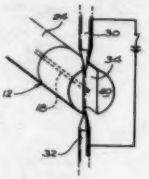
said release levers each having an actuating area inside one of said recesses;

separate boundary elements attached to said connector casing for holding each release lever in a preloaded rest position thereby externally limiting the path of movement of the release levers when said connector casing is in an unplugged position with respect to said counterparts.

4,798,431
OPTIC FIBER CONTACT

Kenneth M. Clark, Irvine; Leslie M. Borsuk, Los Alamitos, and Bruce Coutts, Costa Mesa, all of Calif., assignors to ITT Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 937,575, Dec. 4, 1986, and a continuation-in-part of Ser. No. 2,883, Jan. 13, 1987. This application Dec. 7, 1987, Ser. No. 129,797
Int. Cl.[4] G02B 6/36, 7/26
U.S. Cl. 350—96.20 8 Claims



1. Optic fiber connection apparatus comprising:

a contact having forward and rearward end portions, opposite sides, and an axis, and having a hole extending along said axis for receiving an optical fiber which has a front end, said contact forward end portion having a cross-aperture which extends substantially perpendicular to said axis and which intersects said hole to receive a lens lying at the front end of an optic fiber which extends through said hole, said contact forward end portion including a front end for coupling to an external optical device;

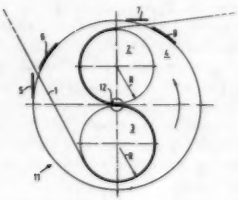
said cross-aperture extending through said contact between its opposite sides to pass an electric arc that can melt the end of an optic fiber to form a lens;

said contact forward end portion being formed of a dielectric material having a melting temperature above 1600° C., to allow an arc to pass through most of the length of the cross-aperture without shorting out the arc or melting the contact.

4,798,432
STORAGE CONTAINER FOR A SECTION OF A LIGHT CONDUCTING FIBRE

Johann A. Becker, Overath, and Detlef M. Boehm, Neunkirchen-Seelscheid, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 8, 1986, Ser. No. 905,220
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532313
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 12 Claims



1. A storage container for a section of a light conducting fibre comprising:

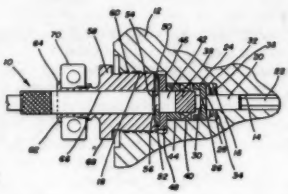
a winding part in the form of a circular turntable supported for rotation, said winding part including an S-shaped winding surface for supporting said light conducting fibre and a peripheral toothed edge; and

a flat storage housing having a width greater than the thickness of said light conducting fibre, enclosing said winding part, said storage housing having first, second and third openings, said toothed edge of said turntable being accessible through said third opening, said conducting fibre extending through said first opening about said S-shaped winding surface and then through said second opening, whereby rotation of said winding part winds said light conducting fibre about said S-shaped winding surface retracting ends of said light conducting fibre into said storage housing.

4,798,433
OPTICAL PRESSURE SEALING COUPLING APPARATUS

Timothy B. Irvin, Woodland Hills, and Richard E. French, Simi Valley, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 16, 1988, Ser. No. 156,518
Int. Cl.[4] G12B 6/38
U.S. Cl. 350—96.21 16 Claims



1. Optical pressure sealing and coupling apparatus for coupling together a probe measuring section disposed in a high pressure cryogenic environment for measuring data therein and a probe monitoring section disposed in an ambient pressure environment for monitoring the data received from the measuring section, said apparatus comprising means defining a housing, an axial passageway inside the housing extending between an end at said high pressure environment to an end at said ambient pressure environment, means in said passageway for receiving and supporting said measuring section at the high pressure end, locating means in said passageway for grasping and axially capturing said measuring section and for urging said measuring section toward said ambient pressure end, an annular seal in said passageway having an outer periphery in sealable engagement with the periphery of the passageway, a rigid optical coupler comprising fused coherent glass fibers disposed in sealing engagement by the inner periphery of said annular seal and abutting an axial end of said monitoring section, axially adjustable means in said passageway adjacent the ambient pressure end for receiving and supporting the monitoring section of said probe, capturing means in said passageway intermediate said coupler and said adjustable means for grasping and axially capturing said monitoring section, and said adjustable means abutting said capturing means for axially disposing an end of said monitoring section in abutment with said coupler remote from the measuring section.

4,798,434
OPTICAL POLARIZATION REGULATOR HAVING A WAVE-GUIDE STRUCTURE

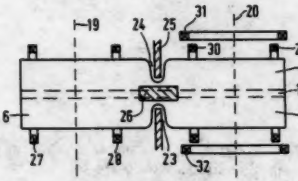
Hans O. B. Dammann, Tangstedt; Elke B. Pross, Hamburg; Gert Rabe, Pinneberg; Wolfgang F. M. Tolksdorf, Tornesch, and Manfred B. Zinke, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 9, 1987, Ser. No. 94,574

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1986, 3630741

Int. Cl.[4] G02B *6/12, 5/30, 27/28*

U.S. Cl. 350—96.11 18 Claims



1. An optical polarization regulator having a wave-guide structure for converting the state of polarization of an optical beam passing through and comprising devices for adjusting the coupling constants K of the TE and TM modes of the optical beam and for adjusting the difference $\Delta\beta$ of the propagation constants β_{TE} and β_{TM} of these modes, characterized in that the wave-guide structure is a layered magnetooptical element, and in that the coupling constant (K) is adjustable by a magnetic field acting upon the wave-guide structure and the difference ($\Delta\beta$) is adjustable by a mechanical deformation force exerted on the wave-guide structure.

4,798,435
OPTICAL SWITCH CIRCUIT

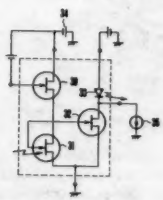
Masahiko Fujiwara; Akira Ajisawa, and Shuji Suzuki, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 16, 1985, Ser. No. 734,725

Claims priority, application Japan, May 17, 1984, 59-99120; Jun. 22, 1984, 59-128715; Apr. 5, 1985, 60-72153; Apr. 10, 1985, 60-76304

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.13 17 Claims



1. An optical switch circuit configured as a matrix having (m×n) crosspoints where m denotes the number of input optical channels and n denotes the number of output optical channels (m and n being a positive integer), wherein when the coordinates of an arbitrary crosspoint are expressed as (i, j) (i=1, 2, . . . m and j=1, 2, . . . n), there are arranged on the (m×n) crosspoints,

(a) optoelectric means for converting an input light signal transmitted via each of said input optical channels into an electric signal,

(b) electric circuit means responsive to a control signal to output an electric signal corresponding to an output electric signal from said optoelectric means, and

(c) light modulating means responsive to said electric signal from said electric circuit means to produce a modulated light signal, and wherein the optical switch circuit comprises:

(i) first means for distributing each of the m number of input light signals into the n number of optoelectric means defined by fixing the i-component of said coordinates of the arbitrary crosspoint, and

(ii) second means for optically combining each of light outputs from the m number of light modulating means defined by fixing the j-component of said coordinates of the arbitrary crosspoint.

4,798,436
OPTICAL FUSED COUPLERS

David B. Mortimore, Felixstowe, England, assignor to British Telecommunications, plc, London, England

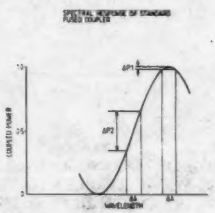
PCT No. PCT/GB86/00445, § 371 Date Mar. 20, 1987, § 102(e) Date Mar. 20, 1987, PCT Pub. No. WO87/00934, PCT Pub. Date Feb. 12, 1987

PCT Filed Jul. 25, 1986, Ser. No. 33,102

Claims priority, application United Kingdom, Jul. 30, 1985, 8519183

Int. Cl.[4] G02B *6/26*

U.S. Cl. 350—96.15 26 Claims



11. An optical coupler formed by the method of forming an optical fibre coupler in which light propagating in one fibre is arranged to be coupled into one or more other fibres within a coupling region and at a predetermined coupling ratio comprising the steps of:

a. preselecting said optical fibres such that the propagating constant of said one fibre within the coupling region is slightly different from the other of said fibres,

b. increasing the length of said coupling region,

c. monitoring the coupler being formed during the increase in the length of the coupling region; and

d. stopping the increase in length when the coupling ratios for two preselected wavelengths are first equal, the optical fibres being such that the coupling ratio at said two preselected wavelengths is equal to said predetermined coupling ratio.

4,798,437
METHOD AND APPARATUS FOR PROCESSING ANALOG OPTICAL WAVE SIGNALS

Robert H. Rediker, Watertown; Frederick J. Leonberger, Lexington, and Darryl P. Greenwood, Westford, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 600,028, Apr. 13, 1984, abandoned. This application Sep. 9, 1986, Ser. No. 906,593

Int. Cl.[4] G02F *1/01*

U.S. Cl. 350—96.14 30 Claims

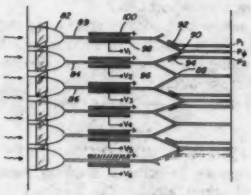
4. An analog optical wave signal processor comprising:

a light source for generating an optical wave signal;

a transmitting waveguide array for collecting discrete seg-

ments of the optical wave signal from the light source in individual waveguides across the optical wave signal and for directing a transmitted wave signal to a distant object;

a receiving waveguide array for collecting discrete segments of a reflected optical wave signal, reflected by the distant object, in individual waveguides extending across the reflected optical wave signal, the receiving waveguide



array comprising waveguide interferometers for combining adjacent segments of the received reflected optical wave signal to provide a wavefront analysis of the received optical wave signal; and

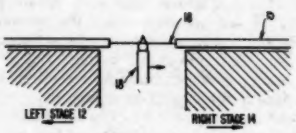
means for controlling the phase delays of individual segments of the optical signal in the transmitting array and of the optical signal in the receiving array to maximize the interferometer outputs.

4,798,438

METHOD OF MAKING A SINGLE-MODE EVANESCENT-WAVE COUPLER HAVING REDUCED WAVELENGTH DEPENDENCE

Douglas Moore, Buffalo Grove, Ill., and Mark E. Marcus, Scottsdale, Ariz., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 15, 1986, Ser. No. 918,966
Int. Cl.[4] G02B *6/42*
U.S. Cl. 350—96.15 **18 Claims**



1. A method of making a single-mode evanescent-wave coupler having reduced wavelength dependence comprising the steps of:

(a) providing first and second single-mode optical fibers having substantially identical propagation constants;

(b) heating the first optical fiber along a first longitudinal segment thereof while stretching the first optical fiber to reduce the diameter of the first longitudinal segment, the reduced diameter being substantially uniform along the first longitudinal segment and different from the diameter of the second single-mode optical fiber;

(c) maintaining the first and second optical fibers in parallel juxtaposition with one another along a portion of the first longitudinal segment; and

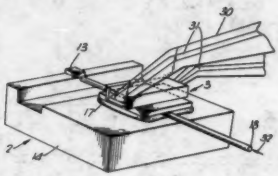
(d) fusing together the portions of the first and second optical fibers maintained in parallel juxtaposition to form a coupling region.

4,798,439

OPTICAL COMPONENT MOUNTING

Keith Preston, Ipswich, England, assignor to British Telecommunications, plc, London, England

Filed Mar. 21, 1986, Ser. No. 842,230
Claims priority, application United Kingdom, Mar. 29, 1985, 8508280
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.20 **13 Claims**



1. A method of mounting an optical component on a substrate, the method comprising the steps of:

(a) fixing the optical component to a carrier plate;

(b) providing the carrier plate with dedicated heating means comprising a miniature resistor fixed to the carrier plate;

(c) providing a localized heating effect to the carrier plate with said miniature resistor; and

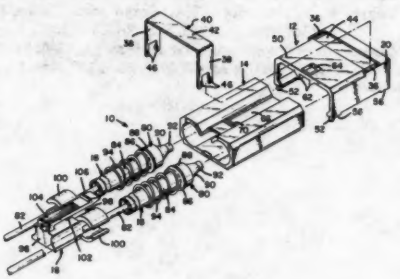
(d) fixing the carrier plate to the substrate with solder, wherein the carrier plate and solder are heated locally by the dedicated heating means.

4,798,440

FIBER OPTIC CONNECTOR ASSEMBLY

John C. Hoffer, and Ronald R. Schaffer, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 24, 1983, Ser. No. 460,230
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **10 Claims**



1. A fiber optic connector assembly of the type for positioning fiber optic connectors relative to light-emitting and light-sensing members comprises a receptacle mountable onto a printed circuit board and in which the light-emitting and light-sensing members are disposed, and a housing in which fiber optic connectors terminated onto fiber optic transmission members are mounted along with springs in a spring-biased condition and which housing is latchably connected to the receptacle, characterized in that:

said fiber optic connectors are mounted in a connector-carrying member which is latchably secured in said housing placing the fiber optic connectors under spring tension thereby forming a fiber optic plug which is disposed in the receptacle; and

a latches member on the fiber optic plug latching the fiber optic plug to the receptacle with the fiber optic connec-

tors positioned adjacent the light-emitting and light-sensing members.

4,798,441

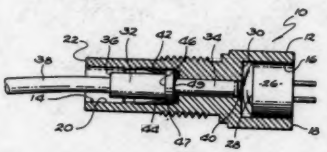
FIBER OPTIC DEVICE COUPLING

Kenneth M. Clark, Irvine, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Mar. 9, 1987, Ser. No. 23,176

Int. Cl.[4] G02B 6/42

U.S. Cl. 350—96.2 **6 Claims**



1. A fiber optic device coupling for connecting an optical fiber cable to an electro-optical device comprising:

a housing having a passage therethrough opening at the opposite ends of said housing;

one end of said passage being adapted to receive an electro-optical device therein having an active face disposed toward the other end of said passage;

a fiber optic contact mounted in the opposite end of said passage, said contact having a forward mating end face and a rear end, said rear being adapted to be connected to a fiber optic cable;

radially movable, resilient contact retention means extending between said contact and the wall of said passage for releasably retaining said contact in said passage;

a forwardly facing shoulder on said contact;

a shoulder on the wall of said passage facing said contact shoulder and spaced therefrom; and

resilient means compressed between said shoulders serving to prevent said forward mating end face of said contact from forcibly engaging the active face of an electro-optical device mounted in said one end of said passage, said compressed resilient means having sufficient resilience to substantially prevent longitudinal rattle of said contact within said passage.

4,798,442

METHOD OF ALIGNING TWO OPTICAL FIBER ENDS FOR FRONTAL CONTACT

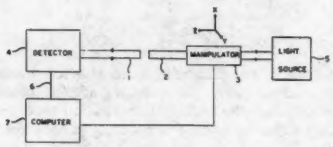
Helmut Feilhauer, Urach, and Josef Steimle, Allmersbach i.T., both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jul. 13, 1987, Ser. No. 72,704

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623619

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.21 **3 Claims**



1. A method of aligning the ends of two optical fibers so that light which is fed into one of the two optical fibers is coupled over to the other optical fiber with a minimum amount of attenuation, one optical fiber end being displaced by means of a manipulator in at least one direction transverse to a longitudinal axis of the two optical fibers until a position is located where a coupled-over light power (P) from one fiber to the other fiber is maximized, comprising the steps of:

(a) moving the manipulator parallel to the longitudinal axis, in a plurality of steps to move the end of the one fiber toward the end of the other fiber;

(b) transversely displacing the manipulator after each step;

(c) recording a change in the coupled-over light power (P) as a function of transverse displacement after each step; and

(d) stopping displacement of the manipulator in the longitudinal direction as soon as the fiber ends reach a relative longitudinal position (z_0) in which further transverse displacement of the manipulator produces nearly no change in the coupled-over light power (P).

4,798,443

OPTICAL CABLE

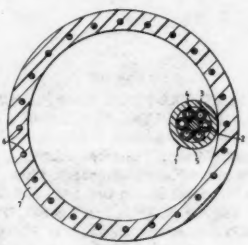
Charles D. Knipe, Rainford, and Edward L. Mather, Liverpool, both of Great Britain, assignors to BICC Public Limited Company, London, Great Britain

Filed Jun. 9, 1982, Ser. No. 386,532

Claims priority, application United Kingdom, Jun. 17, 1981, 8118586

Int. Cl.[4] G02B 6/44

U.S. Cl. 350—96.23 **19 Claims**



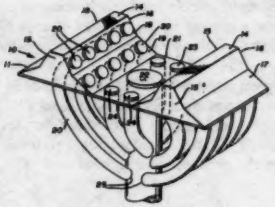
1. An optical cable adapted to be freely supported in long length from spaced supports along a location subject to electrical interference, comprising an optical cable element comprising a plurality of separately formed tubes of plastics material in at least one of which is loosely housed at least one optical fibre and, surrounding the tubes, an outer protective sheath; and, loosely surrounding the optical cable element, an outer protective sleeve which has an inner diameter substantially greater than the overall diameter of the optical cable element and which has embedded in the sleeve at least one layer of circumferentially spaced elongate non-metallic reinforcing members which extend substantially lengthwise of the sleeve, each of the reinforcing members having, in the member, undulations that serve to improve the mechanical bonding of the member within the sleeve and the flexibility of the cable, wherein the optical cable element comprises a plurality of separately formed tubes of plastics material in at least one of which is loosely housed at least one optical fibre and, surrounding the tubes, an outer protective sheath and wherein the optical cable element is loosely housed within and extends helically throughout substantially the whole of the length of the sleeve and is contiguous with the internal surface of the sleeve at least spaced positions along the length of the sleeve.

4,798,444

SOLAR COLLECTION DEVICE

Bret L. McLean, 510 Bonnie Brae, Niles, Ohio 44446

Filed Jun. 12, 1987, Ser. No. 61,421
Int. Cl.[4] G02B 6/04
U.S. Cl. 350—96.24 4 Claims



1. A solar collection device comprising a plurality of fiber optic bundles of a pre-determined size, a main support frame having oppositely disposed angularly aligned upstanding portions in spaced relative relation to one another, pairs of angularly arranged panels are positioned on each of said upstanding portions of said main support frame, a main fiber optic bundle and secondary fiber optic bundles are positioned between said upstanding portions on said main support frame on the same horizontal plane, some of said fiber optic bundles are arranged in aligned spaced relation in said angularly arranged panels on said upstanding portions, a convergent lens in spaced relation to said plurality of fiber optic bundles, means for interconnecting said plurality of fiber optic bundles with said main fiber optic bundle.

4,798,445

PLASTIC OPTICAL FIBER AND PROCESS FOR PRODUCING THE SAME

Takashi Yamamoto, Hiroshima; Katsuhiko Shimada, Otake; Ryuji Murata, Otake; Yasuteru Tahara, Otake; Hiromu Terada, Otake, and Kenichi Sakamaga, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1986, Ser. No. 847,515
Claims priority, application Japan, May 17, 1985, 60-103876
Int. Cl.[4] G02B 6/16
U.S. Cl. 350—96.34 13 Claims

1. A plastic optical fiber comprising polycarbonate as its core material and a polymer, as its cladding material, having a refractive index lower than that of the core material, which is formed by a melt-spinning step, wherein said core material of polycarbonate is supplied to the melt-spinning step in the form of a powder which has not been heated to a temperature exceeding its crystalline melting point at any step other than the melt-spinning step, wherein the relationship between light transmission loss, L_{500} (dB/km), of said fiber as measured at a wavelength of 500 nm and light transmission loss, L_{660} (dB/km), of said fiber measured at a wavelength of 660 nm is expressed by the following relation (I):

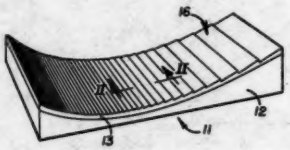
$$L_{500} < L_{660} + 4{,}000 \text{ dB/km} \quad \text{(I)}.$$

4,798,446

APLANATIC AND QUASI-APLANATIC DIFFRACTION GRATINGS

Michael C. Hettrick, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 14, 1987, Ser. No. 95,715
Int. Cl.[4] G01B 5/18
U.S. Cl. 350—162.23 10 Claims



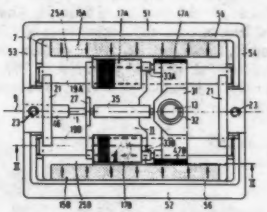
1. A grazing incidence diffraction grating for focusing intercepted x-rays from a first region into an image at a substantially normal incidence focal surface located at another region, said grating having a concave surface formed of reflective material and having a plurality of transverse grooves in said concave surface which define a series of diffraction zones along said concave surface, wherein the spacing of corresponding points in successive ones of said grooves progressively varies along at least a portion of said concave surface and wherein the change of spacing at successive grooves establishes substantially similar magnification along all ray paths from said grating to said focal surface.

4,798,447

LENS MOUNTING FOR AN ELECTRODYNAMIC DEVICE FOR RECORDING ON AND/OR SCANNING OPTICAL DISCS BY MEANS OF A RADIATION SPOT, AND METHOD OF MANUFACTURING SUCH A LENS MOUNTING

Gerardus L. M. Jansen, and Henricus J. Smulders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 666,024, Oct. 29, 1984, abandoned.
This application May 20, 1987, Ser. No. 53,602
Claims priority, application Netherlands, Sep. 12, 1984, 8402777
Int. Cl.[4] G02B 7/02
U.S. Cl. 350—255 1 Claim



1. A method of manufacturing a movable lens mounting for an electrodynamic device for recording and/or scanning optically readable discs by means of a radiation spot, the device comprising a frame having supporting means for guiding movement of the lens on a rectilinear path, the lens mounting comprising a first part having supporting surfaces which engage the supporting means, a second part having a mount for a lens system for focusing a radiation beam to form the radiation spot, and blade springs which connect the first and second parts so that the second part can move relative to the first part

along the optical axis of the lens and perpendicular to said rectilinear path, each spring having opposite ends fixedly embedded in respective first and second parts, the method comprising the steps of:

providing a mold comprising first and second dies, said first die having first molding portions for molding the supporting surfaces of the first part which engage the supporting means and a second molding portion for molding the lens mount of the second part,

arranging the blade springs in the mold, said mold, when closed, forming discrete cavities connected only by said springs,

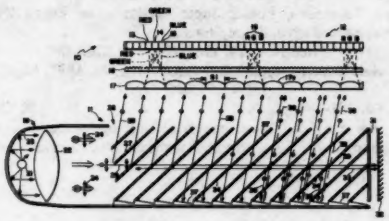
closing the mold and injecting a thermosetting material into the cavities to form the first and second parts connected only by said springs.

4,798,448

HIGH EFFICIENCY ILLUMINATION SYSTEM FOR DISPLAY DEVICES

John A. van Raalte, Princeton, N.J., assignor to General Electric Company, Fairfield, Conn.

Filed Feb. 16, 1988, Ser. No. 156,060
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—345 **18 Claims**



1. An illumination system for a display device having a screen composed of multicelled pixels for producing the primary colors of light, and a light source for illuminating said screen, said illumination system comprising:

means for separating incident light into separate components in accordance with the polarization of said incident light whereby the separate components have different polarizations, and for rotating one of said polarizations whereby all of said pixels receive light having the same polarization; and

means for focusing light onto said pixels.

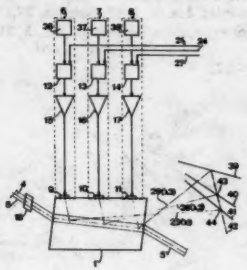
4,798,449

POLYCHROMATIC ACOUSTO-OPTICAL DEFLECTOR

Didier Vichon, Orsay; Dominique Bardon, Paris, and Christian Encrenaz, Gif-sur-Yvette, all of France, assignors to Societe Francaise d'Equipments pour la Navigation Aerienne & Societe Automates et Automatismes, France

Filed Apr. 21, 1987, Ser. No. 40,905
Claims priority, application France, Apr. 25, 1986, 86 06001
Int. Cl.[4] G02F *1/11, 1/33*; G02B *27/14*
U.S. Cl. 350—358 **3 Claims**

1. An acousto-optical deflector for separating at least two deflected emerging rays from a beam composed of a plurality of rays at different wavelengths, and for directing said deflected rays collinearly, the deflector comprising: at least one optical crystal through which said beam passes, said beam having a main optical axis and the emerging rays of different wavelengths having respective secondary optical axes; and a reflecting mirror placed on each of the secondary optical axes, said mirrors being situated one behind another going away from the crystal to constitute at least one intermediate mirror and a most distant mirror which is furthest away from the crystal, said most distant mirror reflecting a corresponding one of said emerging rays along an axis intersecting the other emerging rays or rays, and each intermediate mirror being a holographic mirror having a reflection waveband centered on



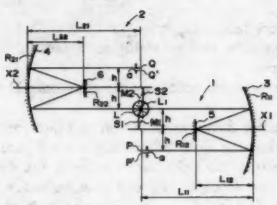
the wavelength of a corresponding one of said other emerging ray or rays deflected by the crystal, and being disposed and oriented to reflect said corresponding emerging ray collinearly with the ray reflected by said most distant mirror.

4,798,450

IMAGING OPTICAL SYSTEM

Akiyoshi Suzaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 742,789, Jun. 10, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,645
Claims priority, application Japan, Jun. 14, 1984, 59-122302
Int. Cl.[4] G02B *17/06*
U.S. Cl. 350—505 **9 Claims**



1. An imaging optical system, comprising:

a first off-axis optical system, having a first optical axis, for receiving light from an object disposed at a predetermined height from the first optical axis, and for emitting the light, said first off-axis optical system producing astigmatism; and

a second off-axis optical system, having a second optical axis, disposed for receiving the light emitted from said first optical system to form an image of the object at a predetermined height from the second optical axis, the first optical axis of said first optical system being spaced from the second optical axis of said second optical system, said second optical system producing astigmatism that minimizes the astigmatism produced by said first off-axis optical system,

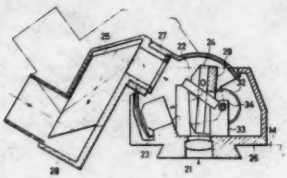
whereby the image formed by said second optical system is substantially completely free of astigmatism within the predetermined height from the second optical axis of the second off-axis optical system.

4,798,451

BINOCULAR TUBE WHOSE ANGLE OF INCLINATION IS ADJUSTABLE

Hiroshi Fujiwara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1987, Ser. No. 57,176
Claims priority, application Japan, Jun. 5, 1986, 61-130961
Int. Cl.[4] G02B *21/20*
U.S. Cl. 350—522 14 Claims



1. A binocular tube whose angle of inclination is adjustable, comprising:

a stationary tube unit;

a movable tube unit rotatably secured to said stationary tube unit;

an ocular tube unit rotatably mounted on said movable tube unit;

first deflector means mounted on said stationary tube unit for deflecting the light advancing toward said ocular tube unit to turn the light backwardly in the direction of its initial course of travel, said first deflector means being located at a point intermediate the path of travel of the light beam from the object being observed to said ocular tube unit; and

second deflector means rotatably supported on said stationary tube unit for deflecting the light emitting from said first deflector means so as to advance along the optical axis of said ocular tube unit.

8. A binocular tube whose angle of inclination is adjustable, comprising:

a stationary tube unit;

a movable tube unit rotatably mounted on said stationary tube unit;

an ocular tube unit rotatably mounted on said movable tube unit;

first deflector means mounted on said movable tube unit for deflecting the light advancing toward said ocular tube unit to turn the light backwardly in the direction of its initial course of travel, said first deflector means being located at a point intermediate the path of travel of the light beam from the object being observed to said ocular tube unit; and

second deflector means mounted on said stationary tube unit for deflecting the light emitting from said first deflector means to advance along the optical axis of said ocular tube unit.

4,798,452

AUTOCLAVABLE LASER BEAM MANIPULATOR

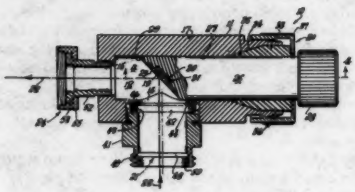
Robert C. Erb, 433 Brockmont Dr., Glendale, Calif. 91202

Filed Oct. 4, 1985, Ser. No. 784,379
Int. Cl.[4] A61B *17/36, 1/06;* G02B *7/18*
U.S. Cl. 350—632 11 Claims

1. An autoclavable laser beam manipulator comprising an aircraft grade aluminum housing having a chamber and ingress and egress ports,

an aircraft grade aluminum gimballing system mounted to and in the chamber of said housing,

a laser grade uncoated molybdenum mirrored element secured to said gimballing system within the housing's chamber, and



a glass-filled plastic member forming an adjusting means for said mirrored element.

4,798,453

EYEGLASS FRAME AND PROCESS FOR INJECTION MOLDING SAME

Kaoru Tokumaru, Fukui, Japan, assignor to Yugen Kaisha Tokumaru Kogyo, Sakai, Japan

Filed Nov. 23, 1987, Ser. No. 124,085
Claims priority, application Japan, Aug. 21, 1987, 62-207478
Int. Cl.[4] C02C *11/02*
U.S. Cl. 351—41 24 Claims

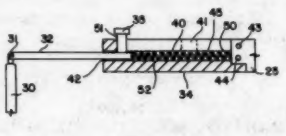
1. An eyeglass frame comprised of an injection molded synthetic resin whose principal material is polyarylate resin.

4,798,454

INTEGRAL REAR VIEW MIRROR FOR EYEGLASSES

Kwang H. Hyun, 914 S. Ardmore St., Los Angeles, Calif. 90005

Filed Oct. 23, 1987, Ser. No. 112,249
Int. Cl.[4] G02C *7/14*
U.S. Cl. 351—50 6 Claims



6. An eyeglass comprising:

a frame;

a pair of lenses supported within said frame;

a pair of temple pieces each defining an elongated channel, a notch and a front opening;

a pair of hinges securing said temple pieces to said frame;

a pair of elongated rods supported within said elongated channels within said temple pieces in extended or withdrawn positions and having portions extending outwardly therefrom through said front openings and defining lock tabs;

a pair of mirrors;

a pair of mirror hinges pivotally attaching said mirrors to said outwardly extending portions of said elongated rods; and

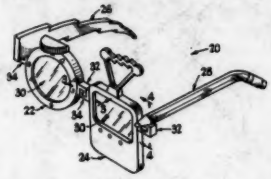
a pair of springs received within said channels and captivated therein to urge said elongated rods to their extended positions.

4,798,455

USER RECONFIGURABLE NOVELTY GLASSES

Craig S. Yoe, Dundee; Michael R. Gibson; Dennis J. O'Patka, both of Chicago, and Wayne A. Kuna, River Forest, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 5, 1988, Ser. No. 152,446
Int. Cl.[4] G02C 11/02
U.S. Cl. 351—51 4 Claims



1. User reconfigurable novelty glasses comprising in combination:

a set of eye frames;

a set of temple pieces;

a first eye frame, selected from the set of eye frames;

a second eye frame, selected from the set of eye frames;

a frame temple piece selected from the set of temple pieces;

a second temple piece selected from the set of temple pieces; and

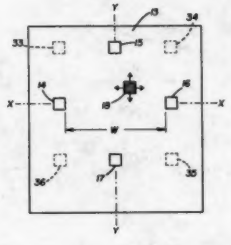
means for combining the first eye frame, the second eye frame, the first temple piece and the second temple piece such that the first eye frame may be used for either the user's right or left eye and the second eye frame may be used for either the user's right or left eye, the first temple piece may be used for either the user's right or left ear and the second temple piece may be used for either the user's right or left ear.

4,798,456

METHOD FOR EVALUATING METAMORPHOPSIA

Jay M. Enoch, Moraga, and Richard A. Knowles, Berkeley, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 23, 1987, Ser. No. 29,313
Int. Cl.[4] A61B 3/02
U.S. Cl. 351—222 10 Claims



1. A method for evaluating metamorphopsia comprising the steps of

displaying at least two first spots in fixed and spaced relationship relative to each other on a display screen having imaginary intersecting and perpendicular X and Y axes,

displaying a second spot on said display screen between said first spots,

selectively moving said second spot in the direction of one or both of said X and Y axes relative to said first spots for observation and comment by a patient,

recording said patient's observation and perception of the center position and alignment of said second spot relative to said first spots, and

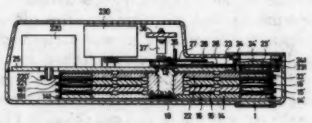
measuring and recording the relative separation distances between said second spot and said first spots and the displacement of said second spot relative to an imaginary line intersecting said first spots to determine spatial distortion and evaluation of metamorphopsia.

4,798,457

SELF-CONSCIOUS TYPE EYE EXAMINING APPARATUS

Kazuo Morohashi, Tokyo; Nobuyuki Miyake, Yokohama, and Tsunemi Gonda, Yamato, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 816,992, Jan. 9, 1986, abandoned, which is a continuation of Ser. No. 526,794, Aug. 26, 1983, abandoned. This application Sep. 1, 1987, Ser. No. 93,158
Claims priority, application Japan, Sep. 3, 1982, 57-152759
Int. Cl.[4] A61B 3/02
U.S. Cl. 351—235 5 Claims



1. An eye examining apparatus comprising:

a base plate having a view field window on an observation optical axis of an eye to be examined;

a cross cylinder member at a position opposite to said view field window and including a series arrangement of a first cylindrical lens and a second cylindrical lens, the first and second cylindrical lenses having powers with equal absolute values and with different polarities and each of the two cylindrical lenses being rotatable about said observation optical axis;

a spherical lens member having power of $C_1/2$ at a position opposed to said view field window;

instruction means for producing first and second instructions alternately, said first instruction designating the creation of cylindrical powers of C_1+C and $-C$ on first and second mutually perpendicular axes, respectively, and said second instruction designating the creation of cylindrical powers of C_1-C and C on said first and second axes, respectively, each of said first and second axes being perpendicular to said observation optical axis; and

actuating means for producing a relative rotation between said first and second cylindrical lenses in response to said instruction means, said actuating means arranging said first and second cylindrical lenses to a first positional relation in response to said first instruction to create, by a combination of said first and second cylindrical lenses, cylindrical powers of $+((C_1/2)+C)$ and $-((C_1/2)+C)$ on said first and second axes, respectively, and arranging said first and second cylindrical lenses to a second positional relation in response to said second instruction to create, by a combination of said first and second cylindrical lenses, cylindrical powers of $+((C_1/2)-C)$ and $-((C_1/2)-C)$ on said first and second axes, respectively, where c is a constant.

4,798,458

ANOMALOSCOPE

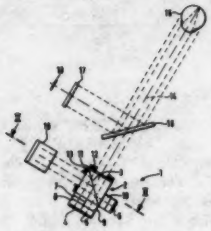
Hartmut Gehrung, Ostfildern; Hermann Krastel, Neckargemuend, and Rainer Kirchhuebel, Wetzlar, all of Fed. Rep. of Germany, assignors to Oculus Optikgeraete GmbH, Dutenhofen, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,637

Claims priority, application Fed. Rep. of Germany, May 7, 1985, 3516285

Int. Cl.[4] A61B 3/06

U.S. Cl. 351—242 16 Claims



1. In an anomaloscope for testing the human color sense, comprising an optical device for producing a stimulus field including a red/green light mix and light of a yellow spectral color, a device for the mixing of the spectral colors green and red by apportioning them, such that upon strengthening one of them, the respective other one is reduced correspondingly, and comprising intensity control and indicating means for the spectral colors as well as for the portions of green and red determining anomal quotient values, the improvement wherein for mixing the red and yellow spectral colors and for creating the stimulus field with a red/green light mix and a field of yellow spectral color, said optical device is provided with a partially translucent beam-splitting means having a beam-splitter plane arranged at approximately 45° relative to the optical axis of said anomaloscope, wherein the first spectral color yellow and the second spectral color (green or red) illuminates said beam-splitter plane from one side approximately parallel to the optical axis, wherein the third spectral color illuminates said beam-splitter plane from the other side in the same area as the second spectral color, and wherein the path of rays of the third spectral color strikes said beam-splitter plane perpendicularly relative to the path of rays of the second spectral color.

4,798,459

OPHTHALMIC LENS CENTERING DEVICE

Christian Joncour, Saint-Maurice, France, assignor to ESSILOR INTERNATIONAL Cie Generale d'Optique, Creteil, France

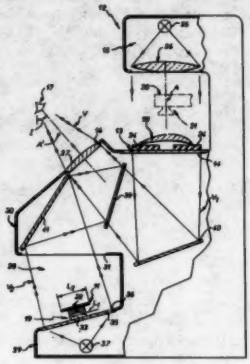
Filed Nov. 20, 1987, Ser. No. 123,318

Claims priority, application France, Nov. 26, 1986, 86 16464

Int. Cl.[4] G01B 9/00

U.S. Cl. 356—127 8 Claims

1. Ophthalmic lens centering device comprising a frame and on said frame a translucent support plate adapted to receive an ophthalmic lens to be centered, a frosted screen at the base of said first support plate, a projector system above said first support plate adapted to project an image of said ophthalmic lens onto said frosted screen, a first observation channel and an opening in said frame enabling an operator to view said frosted screen, a second support plate adapted to receive a template with which said ophthalmic lens is to be compared, a second observation channel adapted in conjunction with said opening in said frame to enable said operator to view said second support plate, said first and second observation channels sharing a common emergent section of which said opening in said frame forms part, and a recess in said frame opening onto a front



surface thereof by means of which said second support plate is disposed at the front of said frame.

4,798,460

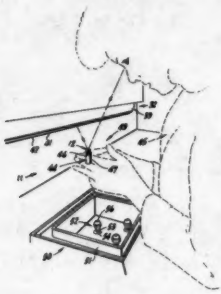
METHOD AND APPARATUS FOR DETECTING AND MODIFYING PERIPHERAL CURVES AND JUNCTION RIDGES IN CONTACT LENSES

Robert D. Buffington, 3806 Winding Creek Rd., Sacramento, Calif. 95825, and Joseph Y. Lilley, 1415 40th St., Sacramento, Calif. 95819

Filed Nov. 7, 1986, Ser. No. 928,481

Int. Cl.[4] G01B 9/00

U.S. Cl. 356—124 6 Claims



1. Apparatus for directly observing contour of the ocular surface of a contact lens, comprising:

a light source including a lamp and a light transmitting sheild provided with at least one light-obscuring band;

means for selectively positioning the lens relative to the light source, with the ocular surface of the lens inclined toward and in proximity to said at least one band, whereby the ocular surface reflects the image of said band, which image is modified by peripheral ridges and curves on the surface.

4,798,461

SYSTEM FOR MONITORING THE GEOMETRY OF A MECHANICAL STRUCTURE

Cyrille F. Pavlin, Septeuil, and Marc Prevost, Saint Maurice, both of France, assignors to Bertin & Cie., Plaisir, France

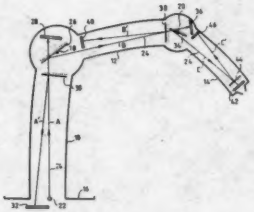
PCT No. PCT/FR86/00246, § 371 Date Mar. 6, 1987, § 102(e) Date Mar. 6, 1987, PCT Pub. No. WO87/00268, PCT Pub. Date Jan. 15, 1987

PCT Filed Jul. 8, 1986, Ser. No. 34,426

Claims priority, application France, Jul. 8, 1985, 85 10435

Int. Cl.[4] G01D *11/16, 11/27, 5/00*

U.S. Cl. 356—138 13 Claims



1. A system for monitoring the geometry of a mechanical structure comprising a plurality of interconnected rigid elements, said system including means for detecting and measuring on a permanent basis the relative positions of said elements, including for each element first and second light beams directed along each element at least between its junctions with the adjacent element, said first and second light beams being directed in opposite directions, photodetector means associated with each element and positioned to receive at least fractions of said light beams, and means associated with each element for directing a fraction of one of the light beams towards an adjacent element of the structure to constitute the corresponding first light beam of said adjacent element.

4,798,462

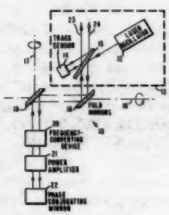
AUTO-BORESIGHT TECHNIQUE FOR SELF-ALIGNING PHASE CONJUGATE LASER

Robert W. Byren, Hermosa Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 20, 1985, Ser. No. 811,793

Int. Cl.[4] G01B *11/26*

U.S. Cl. 356—152 7 Claims



1. A method for automatically boresighting a self-aligned phase conjugate laser having a laser oscillator, a laser amplifier, and a phase conjugation mirror in order to produce an automatically boresighted output beam including the steps of:

pointing a sensor mounted on a stabilized platform in the general direction of a target in order to develop an image of said target and locate a desired aimpoint on said target;

generating a reference laser beam using a laser oscillator mounted on said stabilized platform;

conveying a portion of said reference laser beam to said sensor in order to locate a position corresponding to a location of said output beam generally at said desired aimpoint;

calculating an angle subtended by said reference beam and said target; and

adjusting the position of said platform in order to cause said angle to equal zero.

4,798,463

SPECTROFLUOROPHOTOMETER

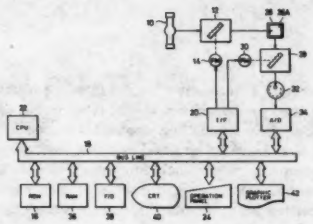
Hiroyuki Koshi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1987, Ser. No. 77,174

Claims priority, application Japan, Aug. 1, 1986, 61-179967

Int. Cl.[4] G01J *3/44;* G01N *21/64*

U.S. Cl. 356—318 8 Claims



1. A spectrofluorophotometer comprising a light source, an excitation side spectroscope for separating a light ray from the light source, a sample cell having a sample to be irradiated with excitation light from the excitation side spectroscope, a fluorescence side spectroscope for separating a fluoroescence generated from the sample by irradiating with the excitation light, detecting means for detecting the intensity of the fluorescence from the fluorescence side spectroscope, and calculation means for processing signals from the detecting means, wherein when a standard sample representing at least two Raman spectral lines is disposed in the sample cell, said detecting means detects the intensity for each Raman spectral line and provides output signals thereof, the calculation means including means for obtaining a ratio of the Raman spectrum in accordance with the at least two Raman spectral lines and for calculating a correction coefficient in accordance therewith, the calculating means further including means for correcting the intensity of the fluorescence detected by the detecting means when a sample to be measured is provided in the sample cell in accordance with the correction coefficient of the ratio of the Raman spectrum.

4,798,464

SCANNING ARRAY SPECTROPHOTOMETER

Roy E. Boostrom, Elmhurst, Ill., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 704,356, Feb. 21, 1985, Pat. No. 4,692,883. This application Mar. 12, 1986, Ser. No. 838,858

Int. Cl.[4] G01J *3/08, 3/10, 3/36*

U.S. Cl. 356—328 34 Claims

1. A spectrophotometer system comprising, in combination:

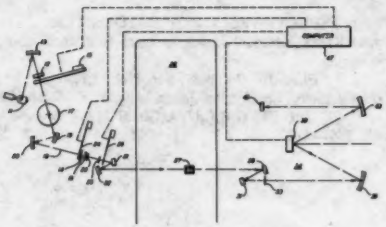
a photodiode array acting as an output detector for said spectrophotometer;

two or more light sources each delivering a useful range of radiant wavelengths to the optical beam of said spectrophotometer, said useful ranges covering in combination the whole of the total spectrophotometric range of the spectrophotometer;

a plurality of shutter means located to interact with said optical beam, and being capable when closed of intercepting all the radiant energy in said beam from one or more of said sources;

fixed and movable filter means locate in said optical beam for providing radiant energy level adjustment to prevent photodiode array response overload over selected wavelength ranges;

a monochromator comprising dispersion means for forming a radiant energy spectrum extended along the whole



receiving photosensitive region of said photodiode array in a fixed predetermined spatial relationship thereto;

computer means including command means for actuating said shutter means and said movable filter means; and

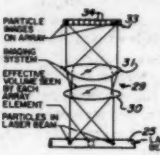
said computer means including means for computational initiation, processing and display of scan generated data correlated with associated spectrum wavelength values.

4,798,465

PARTICLE SIZE DETECTION DEVICE HAVING HIGH SENSITIVITY IN HIGH MOLECULAR SCATTERING ENVIRONMENT

Robert G. Knollenberg, Boulder, Colo., assignor to Particle Measuring Systems, Inc., Boulder, Colo.

Filed Apr. 14, 1986, Ser. No. 851,477
Int. Cl.[4] G01N *15/02, 21/00*
U.S. Cl. 356—336 **20 Claims**



1. A particle size detection device capable of operation with high sensitivity in a high molecular scattering environment, said device comprising:

first means for enabling a mixture of gas and particles to be passed through a predetermined sensing region such that a high molecular scattering background is present at said sensing region;

second means for illuminating said sensing region so that particles in said sensing region cause light scattering; and

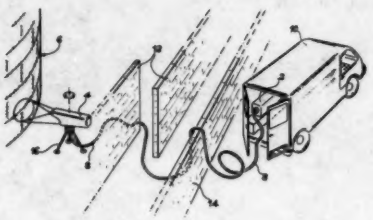
detecting and processing means for receiving light scattered at said sensing region, said detecting and processing means being configured to reduce noise due to background light from molecular scattering occurring within said sensing region to a level that enables detection and processing of light scattered by particles within said sensing region having a diameter of at least as small as 0.1 micron and larger, said detecting and processing means providing an electrical signal output indicative of the presence of such particles sensed in said sensing region.

4,798,466

DEVICE FOR THE NON-DESTRUCTIVE INSPECTION OF A PART BY MEANS OF OPTICAL HOLOGRAPHY

Jacques Bouteyre, Saint Medard en Jalles, and Christian Le Floc'H, Blanquefort, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jan. 20, 1987, Ser. No. 5,694
Claims priority, application France, Jan. 20, 1986, 86 00701
Int. Cl.[4] G01B *9/025*
U.S. Cl. 356—347 **1 Claim**



1. Device for the non-destructive inspection of a part (6) by means of optical holography comprising:

a source (2) emitting a laser beam;

a holographic camera (4) placed at a particular distance from the said source (2), this camera (4) including at least:

an input for the laser beam (28),

means (44) for creating a reference beam (43) and an object ray (45) by separation of the laser beam and

means for creating a hologram from the reference beam (43) and object ray (45) and

means for carrying the laser beam of the source (2) as far as the said input,

wherein the said carrying means include a bundle of sequenced optical fibers (8) each fiber having a core, said bundle being suitable for transmitting a high power laser beam with monomode propagation through the core of each fiber, whilst maintaining the coherence of time and space of this laser beam.

4,798,467

HETERODYNE LASER INSTANTANEOUS FREQUENCY MEASUREMENT SYSTEM

Richard W. Wyeth, Livermore; Michael A. Johnson, Pleasanton, and Michael A. Globig, Livermore, all of Calif., assignors to The United States Department of Energy, Washington, D.C.

Filed Sep. 24, 1986, Ser. No. 911,023
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—349 **8 Claims**

1. A laser beam frequency diagnostic system comprising:

a first pulsed laser for generating a first short time duration pulsed laser beam having a pulse length duration of approximately 10–100 nanoseconds, the instantaneous frequency of which is to be determined,

a second reference laser for generating a second laser beam having a predetermined frequency,

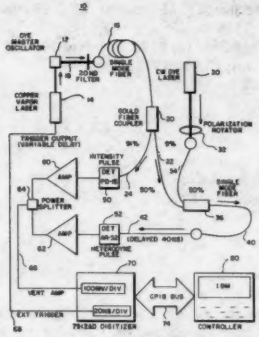
means for heterodyning said first and second laser beams to form a beat signal representative of the difference between said first and second frequencies,

means for processing said beat signal to determine the instantaneous frequency of said first laser beam,

means for normalizing said beat signal,

means for determining the relative phase between said beat

signal and an assumed constant frequency average beat signal, and



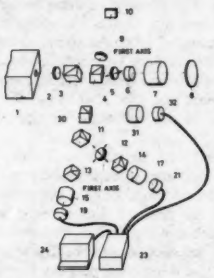
means for determining the derivative of said relative phase versus time.

4,798,468

INTERFERENCE APPARATUS FOR DETECTING STATE OF WAVE SURFACE

Chidane Ohuchi, Hino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1986, Ser. No. 864,148
Claims priority, application Japan, May 28, 1985, 60-114730
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—351 **8 Claims**



1. An interference apparatus for detecting the state of a wave surface comprising:

optical means for supplying a test-sample light and a reference light;

monitoring means for picking up a portion of a light beam composed of said test-sample light and said reference light and for detecting the intensity of the picked-up portion of the light beam;

light dividing means for dividing the light beam composed of the test-sample light and the reference light so as to form a first light beam composed of the test-sample light and the reference light and a second light beam composed of the test-sample light and the reference light;

phase differentiating means disposed in the path of at least one of said first and second light beams and capable of causing a difference between the phase difference between said test-sample light and said reference light in said first light beam and that in said second light beam;

first interference means for effecting interference between said test-sample light and said reference light in said first light beam;

second interference means for effecting interference between said test-sample light and said reference light in said second light beam;

first photoelectric conversion means for receiving he light from said first interference means and converting the received light into a signal;

second photoelectric conversion means for receiving the light from said second interference means and converting the received light into a signal; and

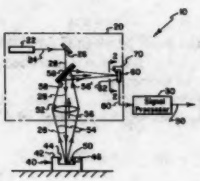
means for detecting the state of wave surface of said test-sample light in accordance with the signals from said first and second photoelectric conversion means and a signal from said monitoring means.

4,798,469

NONCONTACT GAGE SYSTEM UTILIZING REFLECTED LIGHT

Victor B. Burke, 1692 Kingsley Ave., Akron, Ohio 44313

Filed Oct. 2, 1985, Ser. No. 783,344
Int. Cl.[4] G01B *11/08, 11/24*
U.S. Cl. 356—376 **35 Claims**



1. A noncontact gaging system for ascertaining information about features of an object, comprising:

(a) light source means for directing light along an optical path from the light source means onto selected surface portions of an object wherein the selected surface portions lie within a predetermined range of measurement, and for forming an illuminated area on said selected surface portions with the illuminated area being of circular shape, with the illuminated area being of relatively small size, and with the illuminated area retaining an essentially constant diameter over a range of measurement;

(b) optical means for receiving a cone of light that has been reflected along an axis from the illuminated area, and for directing received light along a path to converge toward a real optical image or diverge from a virtual image, said optical means having a front focal plane, and,

(c) light sensitive detector means disposed along said path at a point in fixed relation to said optical means and unrelated to any one image plane from said light for intercepting received non-imaged and unfocussed light that has been directed along the path by the optical means and for providing an output signal that has been derived at least in part from information of the angular spread of light at said focal plane provided by the intercepted light, and that is representative of a characteristic of said selected surface portions of the object.

4,798,470

PATTERN PRINTING METHOD AND APPARATUS

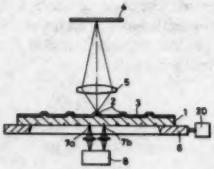
Shigeo Moriyama, Tama; Toshiei Kurosaki, Kodaira; Tsuneo Terasawa, Hachioji; Shinji Okazaki, Urawa, and Yoshio Kawamura, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 927,939

Claims priority, application Japan, Nov. 14, 1985, 60-253686; Nov. 14, 1985, 60-253687

Int. Cl.[4] G01B 11/00

U.S. Cl. 356—401 9 Claims



1. A pattern printing method comprising the steps of:

providing a wafer adapted to have a pattern printed on one side and having a target mark provided on a surface that is on the other side opposite said one side;

detecting said target mark to provide data concerning the precise location of said wafer; and

adjusting the position of the wafer relative to the position of an apparatus for printing said pattern in accordance with the data resulting from detecting said target mark.

4,798,471

APPARATUS FOR MAKING MOLDING SAND

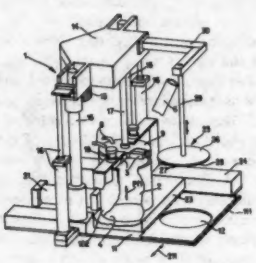
Joachim Laempe, Gewerbegebiet Grienmatt, D-7860 Schopfheim, Fed. Rep. of Germany

Filed May 18, 1987, Ser. No. 51,717

Claims priority, application Fed. Rep. of Germany, May 20, 1986, 3616894

Int. Cl.[4] B28C 5/08

U.S. Cl. 366—65 47 Claims



1. Apparatus for mixing sand with flowable binder material, such as clayey matter, pulverized wood, pulverulent iron oxide and the like, for the making of molding sand, comprising a housing defining a substantially cylindrical mixing chamber; means for admitting into the chamber metered quantities of sand and binder material; and means for mixing the contents of the chamber, including at least one mixing tool operative to mix the contents at least substantially over the entire cross-section of the chamber, and means for moving the mixing tool at least once in the axial direction of the chamber.

4,798,472

EXTRUDER SCREW WITH BALANCED FLIGHTS OF DIFFERENT FUNCTIONAL SECTIONS

Harry Chan, 89 Lakin Ave., Markham, Ontario, Canada L3P 5M6, and Basilio Yi, 35 Hoover Dr., Thornhill, Ontario, Canada L3T 5M6

Filed Jan. 14, 1988, Ser. No. 143,745

Int. Cl.[4] B01F 7/08; B29B 1/06

U.S. Cl. 366—89 2 Claims

1. A plasticating extruder for preparing a plasticated material from solids introduced into the extruder, the latter having a screw placed into an elongate barrel, said screw including:

functional sections having a feed section, a transition section and a metering section in a downstream direction;

a longitudinal axis;

a first primary flight and a second primary flight, the primary flights passing through the transition section and defining channels for continuously conveying the material in the downstream direction as the material is melted within the channels, each said flight having a leading face facing downstream and a trailing face facing upstream, and each said channel extending between the leading and trailing faces, the primary flights in the transition section being opposite one another about the longitudinal axis such that radial forces conveyed to the material in the channels of the transition section are substantially balanced;

two secondary flights, each of them being associated with one of said primary flights for segregating the already plasticated material from the solids in the corresponding channel, the secondary flights being located only in the transition section and being opposite one another about the longitudinal axis such that radial forces conveyed to the material in the transition section are substantially balanced;

the improvement wherein the first primary flight is located only in the feed and transition sections, and the second primary flight is located only in the transition and metering sections, the primary flights being thus spaced apart from one another along the longitudinal axis on a length of substantially one section, and the first primary flight in the feed section and the second primary flight in the metering section being spaced circumferentially apart from one another about the longitudinal axis such that radial forces conveyed to the material in the feed section balance radial forces conveyed to the material in the metering section.

4,798,473

EXTRUDER SCREW

Christiaan J. Rauwendaal, 12693 Roble Veneno La., Los Altos, Calif. 94022

Continuation of Ser. No. 489,759, Apr. 29, 1983. This application Feb. 15, 1985, Ser. No. 701,670

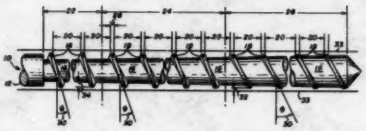
Int. Cl.[4] B29B 1/06

U.S. Cl. 366—89 4 Claims

1. A single extruder screw apparatus comprising:

a screw shaft to operate within a housing barrel and having a feed section for accepting particles of plastic material for placing said particles in contact with the screw shaft and one metering section for propagating molten high viscosity plastic material, the screw shaft having a diameter which progressively increases from said feed section

through said metering section so that the distance from the periphery of the screw shaft to the inner wall of said housing barrel progressively decreases from said feed section to said metering section; and



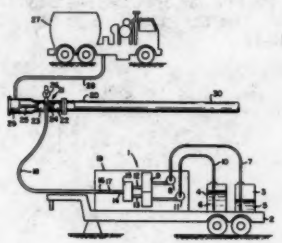
a screw flight spirally positioned about the screw shaft, the screw flight having a screw flight width that is narrower at its periphery in said metering section than in said feed section and having a helix angle which is greater, relative to a perpendicular to the axial centerline of the screw shaft, in said metering section than in said feed section.

4,798,474

IN-SITU PIPELINE COATING SYSTEM

Joseph V. Daily, Spring, Tex., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 22, 1987, Ser. No. 111,509
Int. Cl.[4] B05C *3/02*; B01F *15/04*
U.S. Cl. 118—408 **24 Claims**



1. An apparatus for the proportioning and mixing of two part coating compositions for injection into a pipeline for the in situ coating of the internal surface thereof comprising:

(a) a plural component proportioning device adapted to continuously receive separate amounts of each component of said two-component coating composition, and to discharge predetermined amounts of each component for mixing prior to injection into the pipeline to be coated, said device being self contained so as to preclude solvent vapor discharge and liquid component spills or drips therefrom;

(b) separate storage means for each component of said two component coating composition;

(c) separate conduit means for passing each said component from the storage means to said plural component proportioning device;

(d) means for creating a positive pressure in each separate conduit means to facilitate the passing of each said component from its storage means to said plural component proportioning device;

(e) separate discharge conduit means for passing predetermined amounts of each said component from said plural component proportioning device;

(f) an in line mixer adapted for receiving and mixing the predetermined amounts of said components to form said two component coating composition without exposure to air; and

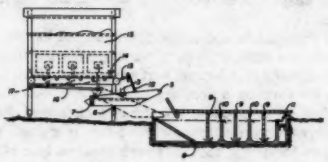
(g) conduit means for passing the two component coating composition from the in-line mixer to the pipeline to be coated, whereby the separate components of the coating composition can be continuously proportioned, mixed and delivered to the pipeline to be coated in a self contained system without solvent vapor exposure, liquid spills, drips, or undesired air bubble formation in the coating composition.

4,798,475

DEVICE FOR PROVIDING LIME TO ACIDULATED WATERS

Anders Strandberg, Boxholm, Sweden, assignor to Boxholmkonsult AB, Boxholm, Sweden

Filed Nov. 26, 1986, Ser. No. 935,436
Claims priority, application Sweden, Nov. 26, 1985, 8505584-6
Int. Cl.[4] B01F *5/06, 15/02*
U.S. Cl. 366—160 **6 Claims**



1. Apparatus for wetting and adding to a flowing stream of water in proportion to the level of water flowing in the stream, a succession of doses of an aqueous solution of a particulate, at least partially dissolvable solid material such as lime,

said apparatus comprising:

a counterweighted vessel having an inlet opening and a pour spout;

means eccentrically suspending the vessel, so that when the vessel is empty and is being filled through the inlet opening, the vessel rests in a level condition in which water and material will accumulate in the vessel, but when a predetermined amount of water and material have accumulated to constitute a single dose, the vessel will temporarily tilt, empty the dose out through said pour spout, and reassume its level condition;

inlet means connecting the flowing stream with the inlet opening of the vessel for supplying the vessel with successive dosage-quantums of water from the stream at a rate which is proportional to the level of water flowing in the stream;

a hopper for particulate at least partially dissolvable solid material such as lime, said hopper having an inlet and an outlet;

conveyor means extending between said outlet of said hopper and said inlet opening of said vessel for supplying said particulate material to said vessel; and

conveyor operating means operatively connected with said vessel for indexing said conveyor means forwards one step for each cycle of tilting and reassumption of level condition of said vessel, whereby one dosage quantum of particulate material from the hopper become mixed with each dosage quantum of water from the stream in the vessel prior to each tilting and emptying of the vessel; and

outlet means for connecting the pour spout of the vessel, when tilted, with the flowing stream, for thereby successively adding to the stream the doses of the aqueous solution after each is made in the vessel.

4,798,476

DYNAMIC PRESSURE TYPE FLUID BEARING

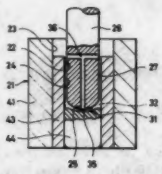
Ikunori Sakatani, Fujisawa; Katsuhiko Tanaka, Yamato, and Masaru Tamaki, Hiratsuka, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,485

Claims priority, application Japan, Apr. 27, 1981, 56-59790[U]; May 6, 1981, 56-64366[U]

Int. Cl.[4] F16C *17/10, 32/06*

U.S. Cl. 384—108 7 Claims



1. A hydrodynamic pressure type fluid bearing comprising:

a housing provided with a cylindrical hole having a cylindrically shaped inner peripheral surface and a bottom surface;

a shaft disposed in said cylindrical hole and having cylindrical-shaped outer peripheral surface opposed to and cooperative with said bottom surface to bear thrust load;

means for forming a pressure chamber between the bottom surface of the housing and the end surface of the shaft;

hydrodynamic pressure generating means including a spiral groove formed in the outer peripheral surface of the shaft for generating a flow of pressurized fluid to said pressure chamber to form a hydrodynamic pressure therein for bearing the thrust load of said shaft when relative rotation is occurred between the shaft and the housing;

means for supplying fluid to the hydrodynamic pressure generating means;

passage means including a circulation passage through the shaft for returning the pressurized flow from the pressure chamber to said fluid supply means, the passage means including an entrance opening formed in the end surface of the shaft so that a fluid flow from the pressure chamber to the circulation passage may be restricted; and

means for closing the entrance opening from the pressure chamber when the hydrodynamic pressure in the pressure chamber is below a predetermined value including an annular portion of said end surface of the shaft which surrounds said entrance opening and a portion of said bottom surface which contacts with said annular portion of the end surface when the hydrodynamic pressure in said pressure chamber is below the predetermined value.

4,798,477

APPARATUS AND METHOD FOR STATIC STRESS MEASUREMENT IN AN OBJECT

David S. Mountain, Waterlooville, United Kingdom, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom

PCT No. PCT/GB85/00403, § 371 Date Jun. 24, 1986, § 102(e) Date Jun. 24, 1986, PCT Pub. No. WO86/01893, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 9, 1985, Ser. No. 865,726

Claims priority, application United Kingdom, Sep. 11, 1984, 8422873

Int. Cl.[4] G01N *21/17, 25/00*

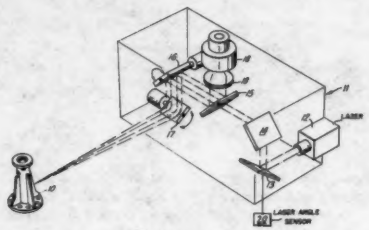
U.S. Cl. 374—45 13 Claims

1. A method for indicating static stress in a predetermined part of an object comprising the successive steps of:

(a) applying a measured pulse of electromagnetic energy to a predetermined surface part of the object;

(b) measuring the temperature of the predetermined surface part of the object;

(c) determining from said temperature measuring step the temperature rise of the predetermined surface part of the object and a local specific heat; and



(d) deriving an indication of local static stress from the local specific heat.

4,798,478

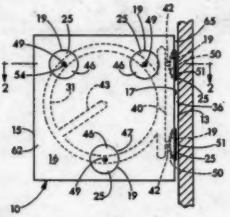
SELF-ALIGNING FLUID BEARING

Kevin R. Crystal, Verona, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Feb. 16, 1988, Ser. No. 155,918

Int. Cl.[4] F16C *32/06, 23/04*

U.S. Cl. 384—12 15 Claims



1. A self-aligning fluid bearing for supporting a moving part and allowing that part to move along at least one flat support surface substantially without friction comprising:

(a) a body including at least one face which is substantially planar and having at least one spheroidal concave depression therein;

(b) means within the body for directing pressurized fluid to each depression;

(c) one planoconvex disk for each depression, each disk including a convex spheroidal surface with a spherical radius which is approximately equal to that of the corresponding concave depression, and an oppositely facing planar surface, the disk having at least one first passageway between the convex surface and the planar surface through which pressurized fluid can pass and being suspended within a cushion of fluid while located largely within the corresponding depression between and in spaced relation to a surface of the depression and to the flat support surface, the concave depression surface and convex surface forming therebetween a second passageway through which pressurized fluid can pass to an outside environment, and the planar surface on the disk forming with the flat support surface a third passageway therebetween through which the pressurized fluid can pass from the first passageway to the outside environment.

4,798,479

SHEET-METAL TYPE ENDLESS RECTILINEAR MOTION ROLLING GUIDE UNIT

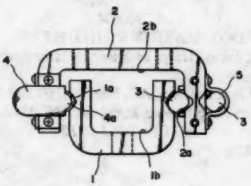
Kunihiko Morita, Kanagawa, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 169,894

Claims priority, application Japan, Apr. 14, 1987, 62-56203[U]

Int. Cl.[4] F16C 29/06

U.S. Cl. 384—45 2 Claims



1. A sheet-metal type endless rectilinear motion rolling guide unit in which two track members made of sheet-metal plates each having a U-shaped cross section are arranged such that bottom surfaces (1*b* and 2*b*) of said track members face each other and first and second track grooves (1*a* and 2*a*) of said track members face each other, and a number of rolling members (3) are inserted between said track grooves (1*a* and 2*a*), thereby relatively rectilinearly moving the track members, wherein:

the first track groove (1*a*) is formed in each of outside walls of a bed (1) serving as one of said two track members in the longitudinal direction of said bed (1);

the second track groove (2*a*) is formed in each of inside walls of a table (2) serving as the other track member in the longitudinal direction of said table (2) so as to face said first track groove (1*a*) formed in the bed (1);

a return passage side plate (5) having a U-shaped cross section and forming a return passage (5*a*) of the rolling members (3) is attached at the opposing free edges and in parallel with the second track groove (2*a*) to each of outside walls of the table (2) on the back side of the second track groove (2*a*) formed in the inside wall of the table (2); and

an end cap (4) formed with a direction turning passage (4*b*) to couple the second track groove (2*a*) and the return passage (5*a*) is attached to each of both ends of the track groove portion in a slide direction of the table (2).

4,798,480

BEARING SYSTEM WITH ACTIVE RESERVOIR BETWEEN TWO AXIALLY SPACED HYDRODYNAMIC BEARINGS

Anton Van Beek, Zoetermeer, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 13, 1987, Ser. No. 108,405

Claims priority, application Netherlands, Oct. 13, 1986, 8602565

Int. Cl.[4] F16C 32/06

U.S. Cl. 384—114 12 Claims

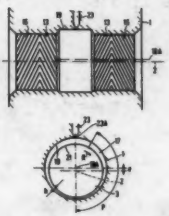
1. A liquid-lubricated bearing system, comprising:

an outer body;

a shaft rotatable relative to said outer body about an axis of rotation;

a pair of axially spaced hydrodynamic bearings comprising cooperating bearing surfaces on said shaft and said outer body, one of the bearing surfaces of each hydrodydnamic bearing having a pattern of bearing grooves for building up pressure in a liquid lubricant present between said bearing surfaces during bearing operation for centering and supporting said shaft in said housing; and

a single annular reservoir between said hydrodynamic bearings for storing said liquid lubricant comprising a pair of opposing cylindrical wall portions of said shaft and said housing, one cylindrical wall portion being eccentric with said axis of rotation or defining a variable radial gap between said cylindrical wall portions such that for relative



rotation of said shaft and housing said cylindrical wall portions cooperate to increase pressure in the liquid lubricant in the region where said variable gap is the smallest for pumping said liquid lubricant in an axial direction to said hydrodynamic bearings.

4,798,481

ROLLING BEARING SLEWING RING

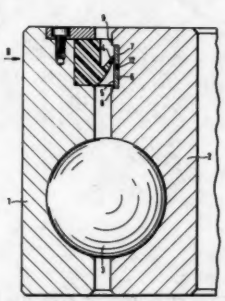
Hubertus Frank, Hochstadt, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Jan. 16, 1987, Ser. No. 3,939

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1986, 3602051

Int. Cl.[4] F16C 33/76; F16J 15/00

U.S. Cl. 384—477 10 Claims

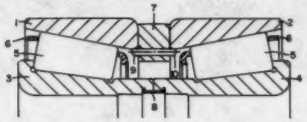


1. A rolling bearing slewing ring comprising two mutually concentric bearing rings between which rolling elements roll, a first bearing ring having a seal in sliding engagement with a cylindrical seal contact surface on a second bearing ring, characterized in that the seal contact surface (5) is a finite band (6) forming a union of its mutually facing ends (10,11) and being of a wear resistant material secured to a retention surface (7,16,22,30,40) of the second bearing ring.

4,798,482
DOUBLE-ROW ROLLER BEARING ASSEMBLY

Stanislaw Kruk, Vastra Frolunda, Sweden, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 24, 1987, Ser. No. 65,788
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1986, 3621381
Int. Cl.[4] F16C 33/36, 43/04
U.S. Cl. 384—571 5 Claims

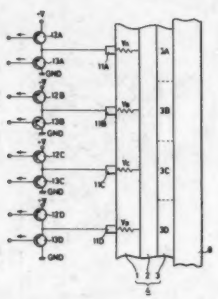


1. Roller bearing assembly comprising a pair of inner ring members and a pair of outer ring members, radially spaced to define bearing spaces therebetween, the rings of each pair having peripherally extending confronting surfaces faced radially toward said bearing spaces, a fastening member connecting one pair of said rings, at least one rigid spacer element disposed between axial end faces of the other pair of rings, and roller elements preventing axially outward movement of said other pair of rings, said spacer having axial projections cooperatively confronting and engaging one pair of said confronting surfaces of said one pair of rings to provide a positive form locking connection in the radial direction, said fastening member and spacer being disposed radially within the inner and outer peripheral surfaces of said bearing assembly.

4,798,483
ELECTROTHERMAL PRINTING APPARATUS WITH ELECTRODES USABLE AS CURRENT SUPPLY OR RETURN

Katsuharu Inaba, Oume, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1987, Ser. No. 78,962
Claims priority, application Japan, Jul. 31, 1986, 61-178906
Int. Cl.[4] B41J 3/20
U.S. Cl. 400—120 4 Claims



1. In an electrothermal printing apparatus including an ink ribbon having a resistive layer, a conductive layer and an ink layer and a printing head provided with a plurality of printing electrodes for locally heating the ink layer to transfer ink from the ribbon to a recording paper when printing current is passed through the printing electrodes, printing electrode driver means comprising:

(a) a plurality of first switching means each connected to each printing electrode, for supplying printing current to the ribbon when activated;

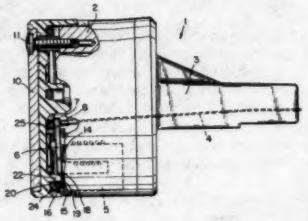
(b) a plurality of second switching means each connected to each printing electrode, for returning the printing current from the ribbon when activated; and

(c) means for supplying a printing current to the ink ribbon via at least one first switching means connected to at least one printing electrode and for returning from the ink ribbon via at least one second switching means connected to at least one other printing electrode, to selectively heat the ink ribbon at ink areas adjoining to the printing electrodes through which the printing current is supplied or returned.

4,798,484
DOT MATRIX PRINT HEAD

Mario Gaiardo, Ivrea, Italy, assignor to Microlys S.p.A., Turin, Italy

Filed Jul. 6, 1987, Ser. No. 69,985
Claims priority, application Italy, Jul. 25, 1986, 53690 B/86
Int. Cl.[4] B41J 3/12
U.S. Cl. 400—124 5 Claims



1. A dot matrix print head comprising:

an elongated support body slidably carrying a plurality of print needles;

a cover for said support body rigidly connected thereto;

respective drive electromagnets for actuating said print needles, the electromagnets being disposed in a circular configuration and each having a first and a second pole of opposite sign adjacent to each other;

a plurality of striker elements disposed in a ring and made of ferromagnetic material, each able to be attracted by the first pole of a respective one of said electromagnets to strike with its first end the head of an associated said needle in such a way as to produce translation thereof; and

support means for resiliently supporting a second end of said striker elements, opposite the first end; wherein, in combination:

(i) each of said striker elements having an intermediate portion corresponding with and operating as a fulcrum upon a fulcrum edge of a flat front delimitation surface of the second poles of the said electromagnets;

(ii) said electromagnets being disposed with their said first poles positioned radially inward of their second poles;

(iii) said support means for the second end of each of said striker element comprising:

a pin formed integrally with and perpendicularly projecting from said cover, said pin being positioned with clearance within the interior of a hole formed through said second end of each striker element, immediately adjacent said intermediate portion thereof; and

a biasing element disposed between said second end of each striker element and said cover, in such a way as to oppose separation of said second end from the associated second pole of the respective electromagnet;

(iv) said second end of each of said striker elements is shaped on the side facing the corresponding second pole of the associated said electromagnet in such a manner as to be displaced, with respect to the associated said fulcrum so as to determine between it and the frontal flat surface of the

associated said second pole an axial clearance, each striker element between its second end and its fulcrum at said fulcrum edge being shaped to engage said biasing element and maintain clearance over said second pole.

4,798,485

ELECTRONIC TYPEWRITER WITH A DETECTOR SWITCH

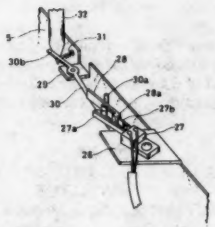
Hiroshi Onoda, Kariya; Kenji Sakakibara, Ichinomiya, and Michitoshi Akao, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 17, 1987, Ser. No. 27,188

Claims priority, application Japan, Mar. 25, 1986, 61-67523; Mar. 25, 1986, 61-67524; Jul. 18, 1986, 61-169999

Int. Cl.[4] B41J *29/38*

U.S. Cl. 400—54 **11 Claims**



1. A typewriter with a keyboard, a frame, a carriage relatively movable along a platen installed in the frame, and a lid for operatively covering the frame, comprising:

a detector switch provided on the frame alternatively being in a first state or a second state;

a first stimulator provided on the lid for changing the detector switch to the first state when the lid is closed and for changing the detector switch to the second state when the lid is opened;

a second stimulator provided on the carriage, and being shiftable between a normal rest position and a shifted position, for changing the detector switch to the second state when the carriage is at an original position along the platen and the second stimulator is in the shifted position and for changing the detector switch to the first state otherwise; and

means for shifting the second stimulator from the normal rest position to the shifted position if the detector switch is in the first state after the typewriter is turned on or when the lid is closed after once opened.

4,798,486

INK RIBBON CASSETTE HAVING MOUNTING MEANS, SLACK PREVENTING MEANS AND MULTIPLE RIBBON SHIFTING MEANS

Masanori Kaneko, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

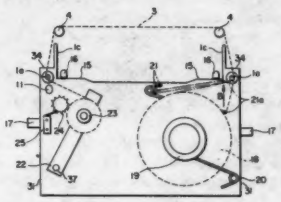
Filed Apr. 23, 1986, Ser. No. 854,862

Claims priority, application Japan, Apr. 26, 1985, 60-88994

Int. Cl.[4] B41J *32/00*

U.S. Cl. 400—208 **3 Claims**

1. An ink ribbon cassette, which houses an ink ribbon supplied from a casing and taken up therein after passing through a recording section, and which is detachably mounted on a carriage of a recording apparatus, comprising first positioning means for positioning said ink ribbon cassette in a first direction when said ink ribbon cassette is mounted on said carriage, and second positioning means for positioning said ink ribbon cassette in a second direction when said ink ribbon cassette is mounted on said carriage, and a tension spring for preventing slackening of the ink ribbon wherein at least one of said first and second positioning means is elastically engaged with positioning means of said carriage, and first and second ink-ribbon guide members disposed at ink-ribbon exit and entrance opening portions, respectively, each member including a linearly elongated portion whose length is substantially equal to the width of the ink ribbon and inclined end portions diverged conically toward the ends thereby when the ink ribbon between said first ink-ribbon guide member and said second ink-ribbon guide member is moved in the widthwise direction of the ink ribbon with respect to said ink ribbon cassette, slackening of the ink ribbon otherwise caused by the widthwise movement being absorbed by twisting the ink ribbon, the twisting causing the ink ribbon to bend.



4,798,487

THERMAL PRINTER HAVING RIBBON TAKE-UP MECHANISM UTILIZING CARRIAGE MOVEMENT

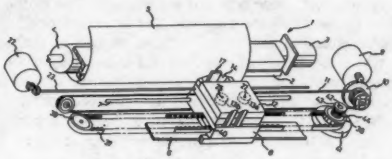
Shigenori Hattori, Aichi, and Koshiro Yamaguchi, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 4, 1987, Ser. No. 45,413

Claims priority, application Japan, May 10, 1986, 61-70382[U]; May 13, 1986, 61-71496[U]

Int. Cl.[4] B41J *33/22*

U.S. Cl. 400—223 **11 Claims**



1. A thermal printer for thermal printing on a recording medium via a print ribbon, comprising:

a generally elongate platen for supporting said recording medium;

a carriage reciprocatingly movable in a longitudinal direction of said platen;

carriage drive means for moving said carriage;

a thermal print head mounted on said carriage, and operable in pressed contact with said recording medium through said print ribbon, for effecting a printing operation on said recording medium;

a take-up spool rotatably supported on said carriage, for winding thereon said print ribbon after the ribbon has passed between said print head and said recording medium;

a generally elongate, longitudinally movable member disposed parallel to said longitudinal direction of the platen;

means for applying a frictional resistance corresponding to

the rotational load applied to said take-up spool when said print ribbon has a suitable tension to said

a power transmitting mechanism supported on said carriage, and engageable with said movable member, said mechanism being activated due to a relative movement between said carriage and said movable member, for rotating said take-up spool, whereby said movable member is movable at a speed lower than a moving speed of said carriage, so as to maintain said suitable tension.

4,798,488

DOT MATRIX PRINT HEAD

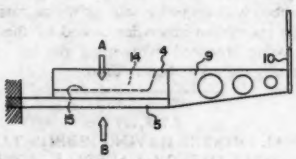
Koji Uezumi, Yokohama, Japan, assignor to NHK Spring Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 769,846, Aug. 26, 1985, abandoned. This application May 7, 1987, Ser. No. 48,999

Claims priority, application Japan, Aug. 27, 1984, 59-178116; Sep. 3, 1984, 59-184955

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—124 **3 Claims**



1. A dot matrix print head comprising a magnetic circuit including a permanent magnet, a magnetic core, a solenoid and a magnetic gap defined by a first pole surface and a pair of second pole surfaces extending orthogonally relatively the first pole surface, a sheet spring rigidly connected at one end to the magnetic core, an armature fixedly secured to a free end of the sheet spring, an arm connected to the armature, and a wire fixedly attached to the other end of the arm, the wire being axially driveable by the restoring force of the sheet spring by interruption and cancellation of the magnetic flux of the permanent magnet with the magnetic flux of the solenoid,

the armature having an open cavity therein in the region where the density of magnetic flux is relatively small, said open cavity facing away from the free end of said sheet spring, said free end of the sheet spring being attached to the face of the armature opposite to the face in which the cavity is formed, said attachment being made by laser welding applied to the bottom surface of the cavity.

4,798,489

INK RIBBON CONTROL APPARATUS FOR LOCATING REPLACEMENT CARTRIDGE COLOR BAND IN A COLOR PRINTER

Keiichi Shiota, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 25, 1986, Ser. No. 899,593

Claims priority, application Japan, Aug. 29, 1985, 60-190311

Int. Cl.[4] B41J *35/16*

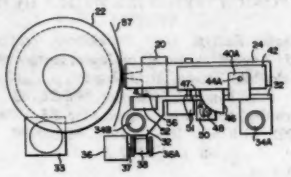
U.S. Cl. 400—216.1 **9 Claims**

1. An ink ribbon control apparatus for a color printer of the type that has a printing head and uses a ribbon cartridge having housed therein an ink ribbon divided in a lateral direction into a plurality of color bands, the control apparatus comprising:

supporting means for supporting the ribbon cartridge, said supporting means permitting selective movement of the ribbon cartridge in the lateral direction of the ink ribbon;

detecting means for generating a first detection signal indicating that the ribbon cartridge is disposed at an initial position which serves as a reference position for changing the color bands and a second detection signal indicating that the ribbon cartridge has been replaced; and

drive means, responsive to said detecting means, for driving said supporting means to move the ribbon cartridge in response to the first and second detection signals, said drive means moving the ribbon cartridge toward the



initial position in response to the second detection signal and moving the ribbon cartridge by a required distance in response to the first detection signal to set a previously selected color band at the same position relative to the printing head of the printer as the color band of the previous ribbon cartridge prior to cartridge replacement.

4,798,490

METHOD FOR USING AND REUSING CORRECTION TAPE ASSEMBLY

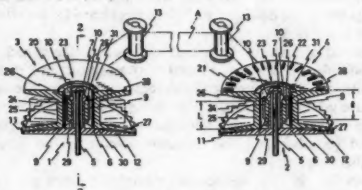
Hiroaki Watanabe, Yokohama, Japan, assignor to Fuji Kagakushi Kogyo Co., Osaka, Japan, a part interest

Continuation of Ser. No. 922,160, Oct. 23, 1986, abandoned, which is a continuation of Ser. No. 685,326, Dec. 24, 1984, abandoned. This application Jun. 2, 1987, Ser. No. 57,286

Claims priority, application Japan, Dec. 28, 1983, 58-203223

Int. Cl.[4] B41J *29/36*

U.S. Cl. 400—697.1 **3 Claims**



1. A method for dispensing and winding a correction tape in a typewriter equipped with a first support shaft member on a tape-dispensing side and second support shaft member on a tape-winding side for the correction tape, said first and second support shaft members being of substantially the same shape and size, the method comprising the steps of:

(1) mounting a first reel containing a full length of wound correction tape on said first support shaft member so that the first reel is rotatable therewith and prevented from accidental slip-off from said first support shaft member;

(2) mounting a second, empty reel which is designed to receive said length of the correction tape on said second support shaft member so that the second reel is rotatable therewith and prevented from accidental slip-off from said second support shaft member, each of said first and second reels having a boss section, said boss section having a first means for preventing a relative rotation between each reel and each support shaft member in cooperation with a first locking pawl (8) erected on a base flange (6) of each support shaft member whether each reel is in normal position or in inverted position; and a second means for frictionally engaging and preventing accidentally slip-off of each reel from each support shaft member in coopera-

tion with a second locking pawl (10) connected to said base flange, said second locking pawl resiliently engaging said second means at the same height above said base flange whether each reel is in normal position or in inverted position, the boss section (23) of each reel comprising an inner sleeve (24) and an outer sleeve (25) integrated together by ribs, the inner sleeve being shorter than the outer sleeve, said outer sleeve having an upper flange (20) and a lower flange (27) which extend integrally from the upper and lower ends thereof, respectively, said outer and inner sleeves and ribs defining therebetween a space which extends through said upper and lower flanges to receive said first locking pawl through either flange, said defined spaced being said first means, the upper and lower ends of said inner sleeve providing engaging portions which are in the form of inwardly inclined tapered surfaces, respectively, said engaging portions being said second means, said first means being engaged with said first locking pawl and said second means being engaged with said second locking pawl when said first and second reels are mounted on said first and second support shaft members;

(3) dispensing the correction tape from said first reel and winding said tape up on said second reel until said second reel contains the full length of the correction tape;

(4) forcing said first reel and said second reel to be detached from said first support shaft member and said second support shaft member, respectively;

(5) inverting said second reel, containing the full length of the correction tape, and mounting the inverted second reel on said first support shaft member so that the second reel is rotatable therewith and prevented from accidental slip-off from said first support shaft member;

(6) inverting said first reel which is empty and mounting the inverted first reel on said second support shaft member so that the first reel is rotatable therewith sand prevented from accidentally slip-off from said second support shaft member;

(7) dispensing the correction tape from said second reel and winding said tape up on said first reel until said first reel again contains the full length of the correction tape; and

(8) repeating the procedures of steps (1) to (7) as many times as permitted by the effectiveness of said correction tape.

4,798,491

RING BINDER MECHANISM

Edwin Lässle, Langenau, Fed. Rep. of Germany, assignor to Robert Krause GmbH & Co. KG, Espelkamp, Fed. Rep. of Germany

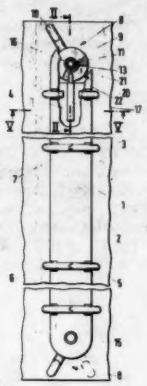
Filed Jun. 3, 1987, Ser. No. 57,587

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621576

Int. Cl.[4] B47F *3/04*

U.S. Cl. 402—39 **17 Claims**

1. A ring binder mechanism for perforated material comprising a resilient mechanism cover, ring rail means comprising two ring rail members mounted on said resilient mechanism cover for pivotal movement between an open and a closed position, ring portions secured to each of said ring rail members such that when said pair of ring rail members are in said closed pivotal position, said ring portions form closed rings to retain said perforated material and when said ring portions are in said open position, said ring portions form open rings which are able to receive said perforated material, actuating means operably engaged with said ring rail means for pivoting said two ring rail members between said open and said closed position, said resilient mechanism cover being elongated and having a longitudinally extending central face, said actuating means being pivotably mounted on said resilient mechanism



cover and being pivotal about an axis perpendicular to said central face.

4,798,492

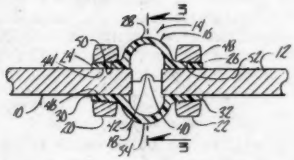
SHAFT COUPLING AND METHOD FOR USING SAME

Thomas R. Smith, 710 W. 11th St., South, Newton, Iowa 50208

Filed Dec. 7, 1987, Ser. No. 129,245

Int. Cl.[4] F16D *1/00*

U.S. Cl. 403—223 **16 Claims**



1. A flexible coupling for joining a first rotatable drive shaft and a second rotatable driven shaft together, each of said shafts having a distal end, a longitudinal axis, and an outer surface, said coupling comprising:

a coupling body comprising a first end hub having an integrally formed tapered outer surface, a second end hub having an integrally formed tapered outer surface, and a central web therebetween, said first and second end hubs each comprising an inner bore, said inner bores of said first and second end hubs being sized to frictionally receive said distal ends of said first and second shafts, respectively;

at least portions of said first end hub, said second end hub, and said central web being integrally formed with one another;

first and second nuts, each having a threaded bore extending therethrough, said threaded bore being tapered along its length so as to conform to said tapered outer surface of said first and second end hubs, respectively;

said first and second nuts surrounding and being directly threaded upon said outer tapered surfaces of said first and second end hubs, respectively, to a lock position wherein said first and second nuts exert an inward radial force on said first and second end hubs, respectively;

said first and second end hubs and said central web all being comprised of an elastomeric plastic material which permits said first and second end hubs to be compressed radially inwardly to reduce the size of said bores therein in

response to said inward radial force caused by said nuts being threaded to said lock position, whereby threading of said first and second nuts to said lock position when said first and second shafts are frictionally received within said bores of said first and second end hubs respectively causes said first and second end hubs to grip and tightly hold said first and second shafts against movement relative to said coupling body.

4,798,493

CERAMIC-METAL COMPOSITE BODY

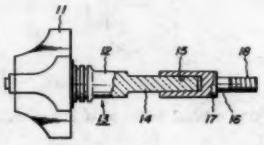
Isao Oda, and Takao Soma, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed May 1, 1986, Ser. No. 857,976

Claims priority, application Japan, Jun. 12, 1985, 60-126294

Int. Cl.[4] B25G *3/00*

U.S. Cl. 403—404 **11 Claims**



1. A ceramic-metal composite body comprising a ceramic member having a projection formed thereon and a metallic member having a structural feature selected from the group consisting of a depression and a through hole formed therein, said ceramic member being fitted to said metallic member by fitting the projection of the ceramic member into said structural feature, wherein a difference between an outer diameter of said projection of the ceramic member and an inner diameter of said structural feature after extraction of said projection from said structural feature is not less than 0.2% of the outer diameter of the extracted projection.

4,798,494

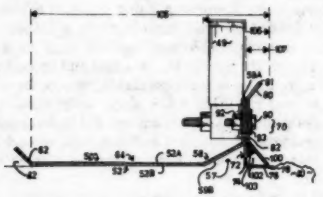
FLOATING VIBRATIONAL SCREED

J. Dewayne Allen, Paragould, Ak., assignor to Allen Engineering Corporation, Paragould, Ak.

Filed Oct. 28, 1987, Ser. No. 114,668

Int. Cl.[4] E01C *19/30*

U.S. Cl. 404—114 **21 Claims**



1. A floating screed for finishing plastic concrete with or without forms, said screed comprising:

an elongated, buoyant pan adapted to float upon plastic concrete, said pan comprising a generally planar flotation surface portion adapted to contact concrete, an interior, and an integral terminal portion;

an elongated blade assembly having a leading edge adapted to initially contact rough concrete during operation of said screed, said blade assembly rigidly coupled to said pan terminal portion and defining a buoyancy flotation volume adjacent said leading edge, said blade assembly comprising:

a rigid L-bracket having a substantially horizontal portion oriented substantially parallel with said pan and terminating in said leading edge, and an integral substantially vertical portion adapted to be fastened to said pan terminal portion; and,

a face plate comprising a central substantially vertically oriented portion adapted to be rigidly secured to said L-bracket and a lower angled portion extending forwardly downwardly into substantial contact with said leading edge whereby to define said flotation volume between said L-bracket and said face plate;

a pair of opposite ends between which said pan and said blade assembly longitudinally extend;

handle means operatively associated with said screed for enabling manual control and manipulation thereof, said handle means coupled to said screed between said opposite ends thereof; and,

vibrator means for vibrating said screed.

4,798,495

APPARATUS FOR INSERTION OF REINFORCEMENT RODS IN A CONCRETE ROAD SURFACE

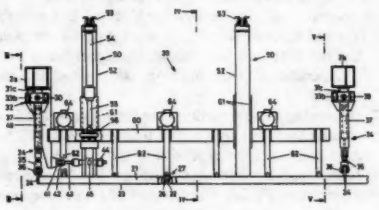
Heinrich Lieuppi, Graenichen, and Paul Rapp, Erlenbach, both of Switzerland, assignors to Erhard Thoma, Gartringen, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 30,880

Claims priority, application Switzerland, Mar. 27, 1986, 1243/86

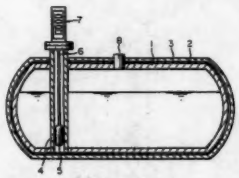
Int. Cl.[4] E01C *23/04*

U.S. Cl. 404—100 **4 Claims**



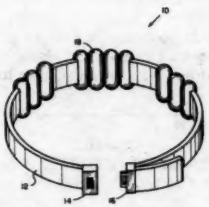
1. Device for insertion of reinforcing rods (22) at locations for transverse joints in a newly-laid concrete road surface (6), encompassing a support (2a), a longitudinal guide (30) attached to the support (2a), a slide (32) which is movable along the longitudinal guide (30), a plate (21) attached to the slide (32), adjustable in height with respect to the slide (32), with slots (26) in the plate disposed parallel to the guide (30), and with holding means (27, 28) for the reinforcing rods (22) attached to the plate 921) in the vicinity of the slots (26), and with a vibration beam (60) which can be displaced vertically above the plate (21) with forks (62) to vibrate the reinforcing rods (22) during insertion, unique in that the plate (21) can be moved horizontally, transversely with respect to the guide (30) by a first piston element (44) attached to support (2a) and disposed transverse to the direction of the slots, the plate (21) can be raised by a second piston element (37), and the slots (26) have a lowermost portion at the underside of the plate and an adjacent portion above the lowermost portion, the lowermost slot portion being wider in the direction transverse to the guide (30) than the adjacent slot portion, wherein following insertion of the rods into the newly-laid concrete surface at a first joint location the plate (21) is moved transversely to smooth over the surface where the rods are inserted, the widened slots facilitating such smoothing, and the plate is then raised by the second piston element (37) above the road surface for transport to the next joint location.

4,798,496
UNDERGROUND TANK WITH LEAK DETECTION MECHANISM
Koji Sawada, Tokyo, Japan, assignor to Nippon Engineer Service Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 31, 1987, Ser. No. 91,037
Claims priority, application Japan, Feb. 10, 1987, 62-27098; May 13, 1987, 62-114873
Int. Cl.[4] B65G 5/00
U.S. Cl. 405—53 4 Claims



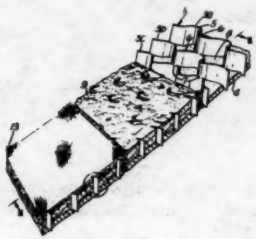
1. An underground tank assembly and a leak detection mechanism therefor, said tank assembly comprising an inner tank in which a liquid is to be contained but which is susceptible to leakage; an outer tank covering said inner tank with a narrow gap therebetween, each of the tanks comprising an upper side and a lower side, and a first conduit (8) defining a fill port for said inner tank extending through said outer tank and said inner tank and through said gap therebetween; said leak detection mechanism comprising a second conduit (4) extending down through said upper sides of said outer tank and said inner tank and through said gap therebetween, through said inner tank and through said lower side of said inner tank and opened into said gap between said inner tank and said outer tank; a float provided in said second conduit (4) responsive to the level of any leaked liquid which has flowed into said second conduit (4) from said gap; and means in said second conduit (4) for detecting the position of said float to thereby provide an indication of leakage of liquid from said inner tank.

4,798,497
DIVING BELT
Joseph A. Bloos, 779 N. 14th St., San Jose, Calif. 95112
Filed Sep. 8, 1987, Ser. No. 93,767
Int. Cl.[4] B63C 11/02
U.S. Cl. 405—186 1 Claim



1. A new and improved weight belt, comprising:
an elongated flexible plastic belt impregnated with a phosphorescent material;
cooperating quick release fasteners provided at opposite ends of said belt;
a plurality of weights attached to said belt;
each of said weights comprising a generally cylindrical lead body having hemispherical end portions and provided with a longitudinal slot through which said belt is received;
frictional engagement of said belt in said slots being sufficient to maintain said weights in adjusted position; and
each of said weights encapsulated in a plastic material impregnated with a phosphorescent substance.

4,798,498
DEVICE FOR STABILIZING BULK MATERIAL
Carl R. Hallberg, Kongsberg, Norway, assignor to A/S Platon, Notodden, Norway
Continuation-in-part of Ser. No. 13,786, Feb. 12, 1987, abandoned. This application May 12, 1987, Ser. No. 48,821
Claims priority, application Norway, Feb. 24, 1986, 860684; Feb. 24, 1987, 870764
Int. Cl.[4] E02D 17/20; E02B 3/12
U.S. Cl. 405—258 18 Claims

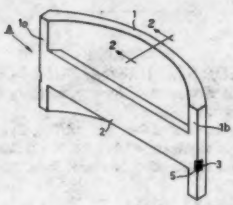


1. A device, especially for stabilizing bulk material to a support surface, wherein an initially relative thin, substantially flat web having a top side and a bottom side and in a first direction is provided with rows of consecutively arranged slit means extending between said sides; said rows of slit means are staggered relative to each other in said first direction so that the web by stretching in a second direction which is angled to said first direction, forms oppositely undulating strips which in turn define rows of side by side arranged cells or pockets between a top side portion of the web adjacent one side of the slit means with a bottom side portion of the web adjacent another side of the slit means; and wherein the cells or pockets in one row are offset in said first direction from the cells or pockets in an adjacent row; and further wherein the web has a "thermal memory" or an introductory stretching which is effected during the production of the web when the web is still soft and hot, and which will initiate the direction in which the strips are to undulate during the final stretching.

4,798,499
RETAINING PANEL
Kunimitsu Yamada, Yokosuka, Japan, assignor to Kensetsukiso Engineering Co., Ltd. and Okabe Co., Ltd., both of Tokyo, Japan
Filed May 15, 1986, Ser. No. 863,307
Claims priority, application Japan, May 17, 1985, 60-105447; Jul. 31, 1985, 60-169126
Int. Cl.[4] E02D 29/02
U.S. Cl. 405—286 5 Claims

1. For use in stabilizing a steep earthen slope, a concrete revetment comprising a plurality of concrete sections, each of which includes an arcuate member having a convex back face, a concave front face and vertical extremities and a front cordal member interconnecting the vertical extremities of the arcuate member; said cordal member being adapted to encase a tension rod passing longitudinally therethrough; means to tension said tension rod to compress said cordal member to tension said arcuate member; means to stack said sections in vertical rows

and to align said sections in horizontal rows, the convex sides of said arcuate members being positioned to face toward said



steep earthen slope and means to anchor each said section to said steep earthen slope.

4,798,500

METHOD OF LAUNCHING LONG PIPELINES

Arthur W. Morton, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 313,873, Oct. 22, 1981, abandoned, which is a continuation-in-part of Ser. No. 258,909, Apr. 30, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 547,290

Int. Cl.[4] F16L *1/04*

U.S. Cl. 405—158 **11 Claims**

1. A method of launching a pipeline from an onshore site into a body of water, said method comprising the steps of:

supporting said pipeline at said onshore site with a plurality of ground engaging movable support means spaced along a length of said pipeline, said support means of said plurality of support means being connected together by a support connecting line;

positioning a launch vessel to a seaward end of said pipeline;

positioning an intermediate floating vessel offshore from said site, deploying a main launching line seaward from a seaward end of said intermediate floating vessel, and providing sufficient buoyancy means to hold said main launching line above said floor of said body of water;

connecting a pipeline launch line between a landward end of said floating vessel and said seaward end of pipeline;

connecting a support means launch line between said landward end of said intermediate floating vessel and said seaward end of said support connecting line;

connecting a seaward end of said main launching line to said launch vessel;

moving said launch vessel seaward and thereby towing said pipeline and said support connecting line into said body of water; and

applying a retarding force to said pipeline and thereby maintaining a tension force in said pipeline, as said pipeline is towed into said body of water, sufficient to hold said pipeline above a floor of said body of water.

4,798,501

FLEXIBLE ROCK ANCHOR

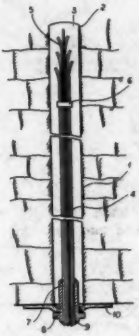
Klaus Spies, Aachen-Schmithof, Fed. Rep. of Germany, assignor to Rudolf Hausherr & Sohne GmbH & Co. KG, Sprockhovel, Fed. Rep. of Germany

Filed Aug. 26, 1987, Ser. No. 89,739

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629365

Int. Cl.[4] E21D *20/02, 21/00*

U.S. Cl. 405—260 **12 Claims**



1. A flexible rock anchor which is insertable in a bore in the ground to a certain depth and is attachable to the walls of said bore at its end facing the deepest portion of said bore by an adhesive means, comprising:

a plurality of lamella cut in a continuous manufacturing process from a plurality of sheet metal strips in close contact with each other and slidable against each other, said width and said thickness of said lamella and the inclined lateral edges of said lamella being such that an optimum circular outer surface is approached, said lamella having a spread portion at the end of said anchor located in said bore shaped to increase the adhering surface for said adhesive and improve the formlocking connection between said anchor and said adhesive;

a ring provided around said lamella adjacent said spread portion to hold together said lamella; and

a sleeve connected by welding with said lamella positioned on the chamber end of said lamella having a head which allows said sleeve to rotate said anchor in an easy way with an outside tool, the heat being produced by said welding being used to give said chamber end of said lamella a cylindrical shape by engaging a tool thereon from the exterior.

4,798,502

CORNER GROUTING NOZZLE

John F. Trout, St. Charles, Ill., assignor to Lily Corporation, Aurora, Ill.

Continuation of Ser. No. 746,051, Jun. 18, 1985, abandoned. This application Aug. 21, 1987, Ser. No. 88,999

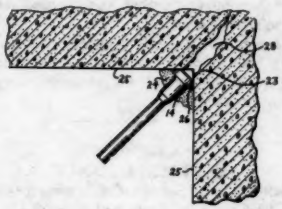
The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] B65B *3/04;* B29F *1/00;* E02D *5/18;* E04G *23/02*

U.S. Cl. 450—269 **1 Claim**

1. A nozzle for injecting sealant into a crack at a corner of two adjoining walls, said nozzle comprising a shank having proximal and distal ends, said shank having an axial bore therethrough communicating with its said proximal and distal ends, said nozzle distal end defining a head having a collar and an integral protruding tip, said tip and at least a portion of said collar being formed by substantially V-shaped converging surfaces adapted for a complemental fit into said corner adja-

cent said crack, said converging surfaces at said tip forming a thin walled means for minimizing blow-back of said nozzle upon injection of said sealant into said crack, said converging



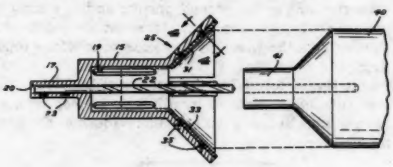
surfaces at said collar forming oppositely disposed contact means for accommodating an adhesive to secure said nozzle to said adjoining walls at said corner with said tip positioned over said crack.

4,798,503

TENON FORMING TOOL

Brian M. Huju, 1650 Deer Lake Way, Grand Rapids, Minn. 55744

Filed Feb. 5, 1988, Ser. No. 152,881
Int. Cl.[4] B23B 51/00
U.S. Cl. 408—211 2 Claims



1. A tenon forming tool as an attachment for a powered hand drill, having in combination,

an elongated cylindrical body portion,

a shank of reduced diameter relative to said body portion being integral therewith and extending rearwardly thereof,

a bore in said body portion of a diameter to receive a tenon to be formed and having a depth corresponding at least to the length of a tenon to be formed,

a counterbore in said shank extending from said bore in said body portion and communicating therewith,

a face portion of said body portion extending forwardly thereof and flaring outwardly thereof,

a plurality of radial slots in said face portion,

a cutting blade mounted adjacent each slot position to have the blade cuttings discharged therethrough,

a pilot drill disposed axially of said bore and extending into said counterbore,

a plurality of slots spaced about said body portion, and

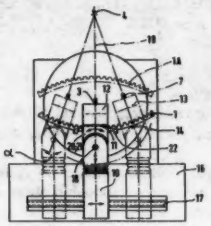
means in connection with said shank securing said drill.

4,798,504

WORKPIECE MACHINING APPARATUS AND METHOD

Piepka Erwin; Willhaf Paul, both of Friedrichshafen, and Gandhihr Subhash, Immenstaad, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP85/00391, § 371 Date Apr. 10, 1986, § 102(e) Date Apr. 10, 1986, PCT Pub. No. WO86/01136, PCT Pub. Date Feb. 27, 1986
PCT Filed Aug. 3, 1985, Ser. No. 855,622
Claims priority, application European Pat. Off., Aug. 17, 1984, PCT/EP84/00253
Int. Cl.[4] B23F 5/26
U.S. Cl. 409—2 16 Claims



1. In apparatus for performing machining operations on a workpiece (1), including a frame (16), a tool (7) engageable with the workpiece, drive means (10,12) effecting programmed displacement of the tool relative to the workpiece through operational strokes in different directions (X,Y,Z) for machining formations thereon, a work holder (2) indexable about an axis (3) the workpiece being mounted thereon and positioning means imparting relative displacement between the tool and the work holder with respect to said indexing axis (3) in synchronism with said programmed displacement for spacing said formations along a predetermined path (5) on the workpiece having a center of curvature (4), the improvement residing in said positioning means including auxiliary drive means (17,18) for radially and tangentially realigning the tool relative to the holder and means (21,24) effecting additional relative displacement between the tool and the holder in one of the directions (Y) for the machining of the formations along said path (5) on the workpiece having the center of curvature (4) thereof radially spaced from the indexing axis (3).

12. In a method of machining a workpiece (1) by means of a tool (7) displaced through operational strokes in at least two different directions (X,Y) relative to the workpiece while positioned on a holder (2) having an indexing axis (3) limiting the operational stroke of the tool in one of the two directions (Y) to a maximum radial distance from said axis, said displacement of the tool through the operational strokes being synchronized with programmed relative displacement between the tool and the holder to machine formations at spaced locations (6,6A) on the workpiece, the improvement including the steps of: realigning said tool relative to the holder; imparting additional relative displacement between the tool and holder in said one of the two different directions (Y); and synchronously programming said additional displacement and the realignment of the tool to perform the machining of the formations at said locations along a curved path (5) on the workpiece having a radius of curvature greater than said maximum radial distance when the center of said curvature and the indexing axis do not coincide.

4,798,505

PROCESS AND APPARATUS FOR REMOVAL OF DUST AND CHIP MATERIAL AT THE MACHINING STATION OF A MACHINE TOOL

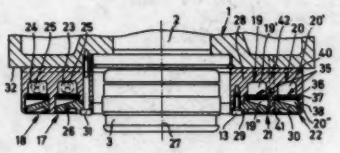
Anton Ameseder, Rorschach, Switzerland, assignor to Starrfrasmaschinen AG, Rorschacherberg, Switzerland

Filed Jul. 15, 1986, Ser. No. 885,950

Claims priority, application Switzerland, Jul. 16, 1985, 3090/85; Jun. 17, 1986, 2458/86

Int. Cl.[4] B23Q *11/12*

U.S. Cl. 409—136 **10 Claims**



1. Apparatus for removing dust and chips from the working point of a machine tool having a spindle, said apparatus comprising:

first and second hollow annular channels concentrically disposed in adjacent relationship about the spindle, said channels sharing a common wall portion, said first and second channels respectively constitute first and second hollow horizontal rings, the first ring being an outer ring and having an outer wall, the second ring being an inner ring and having an inner wall, said common wall portion defining an inner wall for the first ring and an outer wall for the second ring, each ring having a corresponding separate annual clearance defining a corresponding endless nozzle whereby there are two nozzles, and

means for introducing a pressurized fluid into both channels, said fluid being discharged from each nozzle as a separate closed fluid curtain which is substantially cylindrical with entrained dust and chips whereby two concentric spaced apart curtains are discharged.

4,798,506

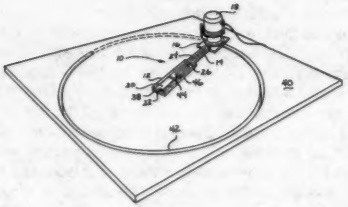
APPARATUS FOR FORMING PRECISELY ARCUATE CUTS IN A WORKPIECE

Earl F. Kulp, Jr., 320 Lincoln St., Charlotte, N.C. 28203

Filed Jan. 21, 1988, Ser. No. 146,329

Int. Cl.[4] B23C *1/20*

U.S. Cl. 409—179 **11 Claims**



1. Apparatus for forming precisely arcuate cuts in a workpiece selectively of any desired arcuate degree up to a full 360° circular cut and of a range of varying radii, said apparatus comprising:

a base;

means for affixing said base rotatably to the workpiece centrally of a desired arcuate cut to be made in the workpiece to define an axis for rotational movement of said base with respect to the workpiece through a full 360° range of movement;

an extensible arm mounted to said base for unitary movement with said base rotationally about said axis and for selective movement relative to said base radially with respect to said axis; and

mounting means affixed to said extensible arm for supporting a cutting tool in cutting relation to the workpiece for forming an arcuate cut in the workpiece during rotational movement of said base.

4,798,507

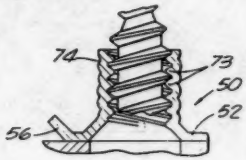
SHEET METAL U-NUT

Benjamin Olah, Santa Fe Springs, Calif., assignor to California Industrial Products, Inc., Santa Fe Springs, Calif.

Filed Jul. 18, 1985, Ser. No. 756,850

Int. Cl.[4] F16B *37/02, 37/04*

U.S. Cl. 411—175 **1 Claim**



1. A sheet metal U-nut formed from a single flat piece of metal, comprising:

a first portion having a generally cylindrical sleeve drawn therefrom;

a second portion integral with said first portion having a hole formed therein for passage of a sheet metal screw which is aligned with the sleeve centerline axis;

a third portion interconnecting the first and second portions and holding them in spaced apart relation;

a retainer ring partly sheared from the second portion to form the hole in the second portion and angularly bent toward the first portion with its free end formed to extend angularly of the plane of the remainder of the retainer ring;

a double thread formed in the interior of the sleeve for at least two full revolutions by roll-form tapping with a tap having thread shaped with a flattened root at the apex of the tap thread angle.

4,798,508

MACHINE AND METHOD FOR OPENING A FILLED BAG, EMPTYING THE BAG, AND DISPOSING OF THE EMPTY BAG

John W. Lewis, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1988, Ser. No. 172,929

Int. Cl.[4] B65G *63/04;* B65B *69/00*

U.S. Cl. 414—412 **7 Claims**

1. A machine for slitting a filled bag to divide the bag into sections, emptying the contents of the bag, and disposing of the empty bag sections, the machine comprising:

a first gripper unit and a second gripper unit:

each gripper unit includes a rotatable spiked drum having an outside wall surface, the drums being spaced apart, several rows of rigid spikes being fastened to each drum, the spikes extending outwardly from the outside wall surface of each drum, the spikes in each row being spaced apart, and each row of spikes being spaced from an adjacent row:

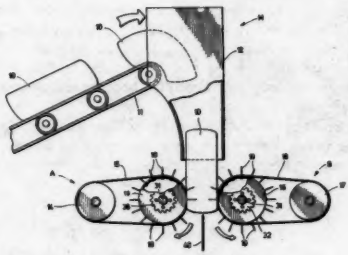
each gripper unit further includes a belt means and an idler roller, with each belt means connecting the rotatable

spiked drum to the idler roller, each belt means having openings therein, with the spikes on each drum extending through these openings and beyond the belt means:

a drive means for simultaneously rotating the spiked drums in each gripper unit, each drum being rotated in a direction opposite from that of the other drum;

a guide means positioned adjacent to the rotatable drums in each gripper unit, for guiding a filled bag into the space defined between the rotatable drums:

a cutter means positioned adjacent to the rotatable drums in each gripper unit and in direct alignment with the space defined between said drums, the cutter means being



adapted to engage a filled bag and cut the bag into sections, and the rotational direction of each drum being such that the filled bag is moved into contact with the cutter means;

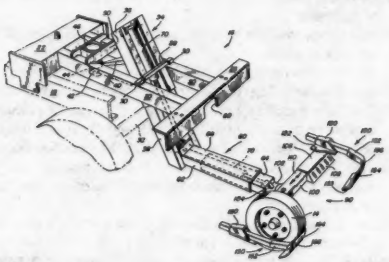
wherein, in operation, the filled bag enters the space between the rotating spiked drums and becomes impaled on the spikes, the rotating drums move the impaled bag against the cutter means, the cutter means slits the bag to divide it into sections, the contents of the bag fall away from the rotating drums, and each bag section is carried on the spikes of one of the rotating drums to a point where the moving belt means causes the bag section to be released from each drum.

4,798,509

TOWING APPARATUS

Leslie Bubik, Toronto, Canada, assignor to Vulcan Equipment Company, Ontario, Canada

Division of Ser. No. 752,980, Jul. 8, 1985, Pat. No. 4,637,623.
This application Jun. 6, 1986, Ser. No. 872,137
The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.
Int. Cl.[4] B60P *3/12*
U.S. Cl. 414—563 **11 Claims**



1. A wheel-lift vehicle towing device comprising:

spaced apart generally parallel supports mountable on the frame of a towing vehicle;

an axle, each end of which is attached to one of the supports;

a column mounted rotatably on the axle and movable through an arc about the axle;

a lever arm fixed at one end to the column above the axle and at the other end to a hydraulic actuator positioned between the spaced apart supports;

an inner column member one end of which is slidably mounted inside the column, the other end of which is external to the column;

a boom, one end of which is attached to the lower end of the inner column member and forms an obtuse angle with the inner column;

a transverse beam pivotally fixed to the end of the boom spaced from the inner column members;

a collar pivotally mounted on each end of the transverse beam;

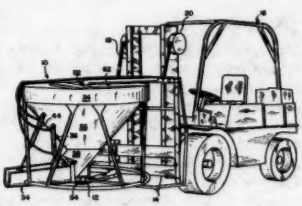
means for supporting a vehicle wheel removably engageable with each collar.

4,798,510

CONCRETE BUCKET ASSEMBLY RIGIDLY MOUNTED FOR VERTICAL TILTING AND ROTATIONAL MOVEMENT TO A FORKLIFT VEHICLE

James E. Lazenby, 808 Daisy St., Monroeville, Ala. 36461

Filed Jan. 14, 1988, Ser. No. 143,749
Int. Cl.[4] B65G *69/00*
U.S. Cl. 414—607 **11 Claims**



1. A concrete bucket assembly disposed for vertical and rotational movement comprising:

a lifting apparatus having support means thereon disposed for vertical and tilting movement;

a concrete bucket having an upper open portion to receive a concrete mixture therein and a lower funneled portion for discharging said concrete mixture;

closure means operable for retaining and directing said mixture into and out of said bucket;

actuating means carried by said lifting apparatus and disposed for actuating said support means for the vertical and tilting movement thereof and for actuating said closure means for opening and closing thereof; and

ball and socket means carried by said bucket and said support means and disposed in substantially axial alignment at said upper and lower portions of said bucket to permit rotational movement thereof.

4,798,511

METHOD AND APPARATUS FOR ATTACHING A LOADER TO A TRACTOR

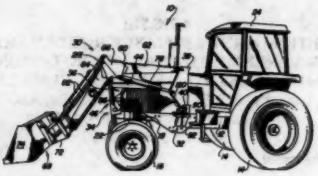
Edward T. Kaczmarczyk, Welland; Rory Rae, Port Colborne, and Roger A. Noyes, Niagara Falls, all of Canada, assignors to Deere & Company, Moline, Ill.

Filed Dec. 23, 1986, Ser. No. 946,221
Int. Cl.[4] E02F *3/627*
U.S. Cl. 414—686 **29 Claims**

1. A method of detachably mounting an implement such as a loader to a tractor, the implement including a fore-and aft extending frame and a hydraulically operated boom pivotally connected to the frame, said method comprising the steps of:

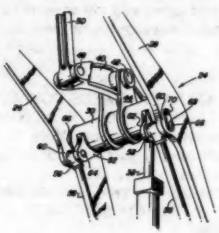
securing a slotted bracket to the tractor;
providing a pin at the aft end of the frame;
positioning the pin in the slotted bracket;
rotating the forward end of the frame upwardly about the pin;
securing the upwardly rotated forward end of the frame to bracket structure located at the forward end of the tractor;
moving the pin in the slot; and
positioning a block against the pin to secure the pin in the slot.

18. In a loader adapted for mounting on and dismounting from a tractor having a fore-and-aft extending tractor frame, the loader including a mast having transversely spaced fore-and-aft extending mast beams, upright beams fixed to the aft ends of the respective mast beams, and a forward frame member connecting the forward ends of the mast beams, a boom pivotally connected to the upright beams and extending forwardly therefrom to a ground-engaging tool such as a loader bucket, and cylinder means for pivoting the boom with respect to the upright beams, attaching structure for connecting the loader to the tractor, comprising:



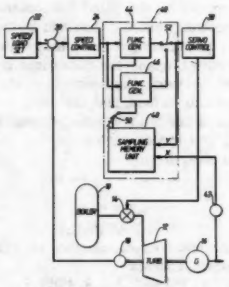
a pair of brackets connected to the sides of the tractor frame, the brackets each including an elongated slot with a pocket located at one end of and offset from the slot, said upright beams including pin means adapted for receipt by the respective slots for pivotally connecting the mast to the tractor frame, said pin means movable along the slots, means for rotating the mast to move the pin means from the slots and into said pockets, said brackets further comprising spring wedge means for automatically securing the pin means in the respective brackets as the pin means move into the pockets, and means for securing the forward end of the mast to the tractor frame to thereby restrict rocking of the mast with respect to the tractor frame.

4,798,512
LOADER BOOM CONSTRUCTION
Dwayne J. Intveld, Hazel Green, Wis., assignor to Deere & Company, Moline, Ill.
Filed Sep. 11, 1987, Ser. No. 96,419
Int. Cl.[4] E02F *3/36*
U.S. Cl. 414—722 **6 Claims**



1. In a material handling machine having a main frame that pivotally supports a vertically swingable boom having a pair of transversely spaced boom arms that are rigidly interconnected by at least one transverse tube extending between the arms and a pair of parallel hydraulic cylinders respectively having one end connected to the frame and an eye member having a transverse bore and mounted on the other end, the combination therewith of improved means for connecting said respective other ends of the cylinders to the boom comprising:
a cylinder mounting area integral with each boom arm adjacent to and offset from the opposite ends of the cross tube;
a pair of tabs respectively rigidly mounted on and adjacent to the opposite ends of the cross tube, the tabs being respectively spaced from the respective arms approximately the same distance as the width of the respective eye members;
a transverse bore through the respective boom arm mounting areas and cross tube tabs, the eye members of the respective cylinders being disposed between the respective mounting areas and cross tube tabs with the eye member bore aligned with the bores in the mounting areas and tabs;
and a pair of removable pins respectively extending through the bores in the mounting areas, eye members and tabs to connect the ends of the cylinders to the boom.

4,798,513
TURBINE CONTROL DEVICE
Youichi Tone, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Aug. 31, 1987, Ser. No. 91,026
Claims priority, application Japan, Sep. 9, 1986, 61-210750
Int. Cl.[4] F01D *17/06*
U.S. Cl. 415—17 **11 Claims**



1. A device for controlling a turbine which is driven by a flowing fluid, the device comprising:
means for determining a desired flow rate of the fluid;
a valve for controlling the flow rate with a variable degree of opening;
means for producing a signal indicative of a degree of opening of the valve;
means for producing a signal indicative of flow rate;
means for sampling the degree of opening signal and the flow rate signal and memorizing a plurality of points each indicative of a sampled flow rate and an actual degree of opening of the valve for producing the sampled flow rate;
means for converting the desired flow rate into a valve degree of opening command signal based on the memorized points; and
means for operating the valve according to the valve degree of opening command signal.
wherein the means for converting the desired flow rate into a valve degree of opening command signal comprises: first and second function generators each having an operational mode for converting the desired flow rate into the valve degree of opening command signal based on a pres-

ent function and a presetting mode for presetting a function baed on the memorized points; and means for controlling one of said function generators to be in the operational mode and the other functional generator to be in the presetting mode, and switching over the first and second function generators between the operational mode and the presetting mode.

4,798,514

NOZZLE GUIDE VANE STRUCTURE FOR A GAS TURBINE ENGINE

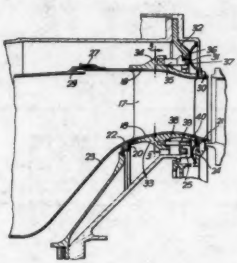
George Pask, Stanton-by-Bridge, England, assignor to Rolls-Royce Limited, London, England

Continuation-in-part of Ser. No. 903,703, May 4, 1978, abandoned. This application Jun. 24, 1980, Ser. No. 165,953

Claims priority, application United Kingdom, May 5, 1977, 18782/77; France, Apr. 28, 1978, 78 12740; Italy, Apr. 28, 1978, 22829 A/78; Fed. Rep. of Germany, May 5, 1978, 2819808

Int. Cl.[4] F01D 5/14

U.S. Cl. 415—115 **10 Claims**



1. A nozzle guide vane assembly for a gas turbine engine comprising:

fixed engine structure;

inner and outer platform rings, both of said inner and outer platform rings being made substantially entirely of a thin relatively flexible porous sheet material having tortuous passages therethrough whereby cooling air may pass through each of said rings from one surface to the other surface thereof;

a plurality of aerofoil portions extending between said rings and having inner and outer extremities extending through and out of said rings, said aerofoil portions receiving substantially all of any loads on said platform rings; and

mounting means directly connected to said inner and outer extremities of each of said aerofoil portions for mounting said aerofoil portions from said fixed engine structure, said mounting means directly supporting said aerofoil portions from said fixed engine structure and indirectly supporting said inner and outer rings through said aerofoil portions from fixed engine structure whereby operational loads on said aerofoil portions and loads on said rings received by said aerofoil portions are transferred to said fixed engine structure.

4,798,515

VARIABLE NOZZLE AREA TURBINE VANE COOLING

Edward S. Hsia, Cincinnati; John H. Starkweather, West Chester, and William K. Koffel, Cincinnati, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 19, 1986, Ser. No. 895,016

Int. Cl.[4] F04D 29/38

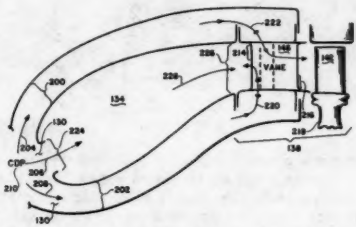
U.S. Cl. 415—115 **17 Claims**

1. Variable nozzle area movable vane apparatus for an axial flow hot fluid turbomachine comprising:

a hollow interior vane member having leading and trailing edge portions orientable partially crosswise of the annularly disposed hot fluid stream of said turbomachine, said vane member including open centered innermost and outermost trunnion portions radial axis disposed of said annular stream and located adjacent the inner and outer extremeties of said annular fluid stream;

a first thinwalled impingement cooling baffle insert member received via a first of said open centered trunnion portions in said vane hollow interior, said first baffle insert including impingement cooling fluid apertures disposed adjacent the interior surface of said vane leading edge portion;

a second thinwalled impingement cooling baffle insert member received via a second of said open centered trunnion portions in sand vane hollow interior, said second baffle



insert including impingement cooling fluid apertures disposed adjacent the interior surface of said vane trailing edge portion;

a first source of pressurized coolant fluid communicating via said first vane trunnion portion with the centrum of said first impingement cooling baffle insert member;

a second source of pressurized coolant fluid communicating via said second vane trunnion portion with the centrum of said second impingement cooling baffle insert member; and

means coupled with at least one of said vane trunnion portions for rotating said vane about said radial axis in variation of said crosswise orientation and for effecting rotational deflection of vane impinging portions of said hot fluid stream.

4,798,516

BLOWER-CONVEYOR FOR TEXTILE FIBER TUFTS IN A CLEANING LINE AND METHOD

Peter Jagst, Monchen-Gladbach, and Axel Thaanheiser, Hof/S.-Moschendorf, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 641,257, Aug. 16, 1984, abandoned. This application Jul. 18, 1986, Ser. No. 887,058

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1983, 3330199

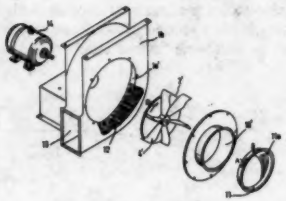
Int. Cl.[4] F04D 29/00; B07B 7/06

U.S. Cl. 415—121 A **6 Claims**

1. In a fiber processing line formed of a plurality of fiber processing machines connected by a conveyor duct, a blower-conveyor arranged for driving fiber tufts in an air stream through said conveyor duct; the blower-conveyor including a discharge housing, a rotary impeller supported in said discharge housing; means defining an inlet opening in the discharge housing for drawing the fiber material into the blower axially with respect to said impeller; said inlet opening being connected to said duct; said discharge housing including a housing wall generally circumferentially surrounding the impeller and bounding a blower outlet connected to said duct; the improvement comprising waste separating means integrated in said blower-conveyor; said waste separating means including throughgoing openings in said housing wall for providing

passages for waste from the fiber tufts upstream of the outlet opening as viewed in a direction of advance of the fiber tufts; said openings being sized to be sufficiently large to allow passage therethrough of waste larger than dust particles and sufficiently small to prevent passage of fiber tufts therethrough.

6. In a method of pneumatically conveying fiber tufts in a conveyor duct consecutively connecting to one another a plurality of fiber processing machines, including the step of generating an air stream by an impeller of a blower-conveyor



having a low pressure side and a high pressure side connected to said duct, whereby the air stream and the fiber tufts therein pass through said blower-conveyor; the improvement comprising the step of separating waste from the air stream within the blower-conveyor by centrifugal forces applied to the waste by the impeller; the step of separating waste including the step of passing the waste through openings in a curved discharge housing accommodating the impeller; the openings being sized to be sufficiently large to allow passage therethrough of waste larger than dust particles and sufficiently small to prevent passage of fiber tufts therethrough.

4,798,517

PUMP

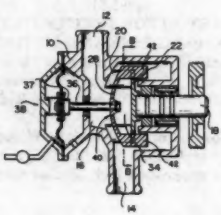
Takehiko Katsumoto, Kyoto, and Kunio Kikuchi, Odawara, both of Japan, assignors to Mitsubishi Jidousha Kogyo Kabushiki Kaisha, Japan

Filed Sep. 30, 1987, Ser. No. 102,671

Claims priority, application Japan, Sep. 30, 1986, 61-148768[U]

Int. Cl.[4] F01D 7/00

U.S. Cl. 415—131 **6 Claims**



1. A pump comprising:

a casing housing a working chamber and an impeller, said impeller being mounted in said casing on a rotational shaft;

said impeller comprising:

a blade wheel mounted on said rotational shaft for rotation therewith;

a plurality of pumping blades extending axially from the periphery of said blade wheel;

a cover mounted within said casing and fitted over said blade wheel for rotation therewith, said cover having an end face member defining one side of said working chamber and a cylindrical skirt portion depending from the periphery of said end face member and encircling said blade wheel, whereby a hollow interior space is defined between said end face member and said blade wheel, said end face member having a plurality of slots through which said blades extend into said working chamber; and

a plurality of pockets formed in the interior surface of said cylindrical skirt portion of said cover, each of said pockets defining a mating surface for that portion of one of said blades extending into the interior of said impeller whereby said blade portion is flush against said mating surface during pumping; and

actuator means for moving said blade wheel relative to said cover.

4,798,518

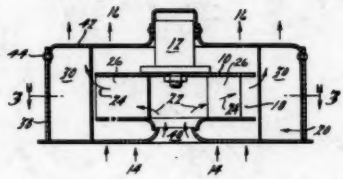
FAN UNIT FOR USE WITH DUCT SYSTEMS

Vinzenz Holzberger, Gailldorf, and Friedrich Koger, Neuenstein, both of Fed. Rep. of Germany, assignors to Wilhelm Gebhardt GmbH, Waldenburg, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,492

Int. Cl.[4] F04D 29/44

U.S. Cl. 415—211 **15 Claims**



1. A fan unit comprising a housing, a radial flow impeller arranged within said housing to be driven by a motor, so as to draw in a gaseous medium which is expelled from the impeller in a radial indirection, and a guide radially enclosing and adjacent to the impeller, the guide being mounted inside the housing which is of substantially uniform cross-section, and having a plurality of axially extending blades arranged to direct the medium flow emerging from the impeller into an axial direction, the guide blades being inclined in a circumferential direction in relation to the axis of rotation of the impeller, and each guide blade having an arcuate profile, in radial section, extending axially beyond blades of the impeller at both ends thereof and having its radially outer edge in proximity or adjacent to said housing.

4,798,519

COMPRESSOR PART SPAN SHROUD

Robert H. Zipps, East Hartford; Kent A. Lyons, East Haddam, and Evans E. Griffin, Colchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 24, 1987, Ser. No. 88,776

Int. Cl.[4] F01D 5/22

U.S. Cl. 416—191 **7 Claims**

1. A compressor blade assembly for compressors operating at transonic or supersonic blade speeds comprising:

a rotor shaft;

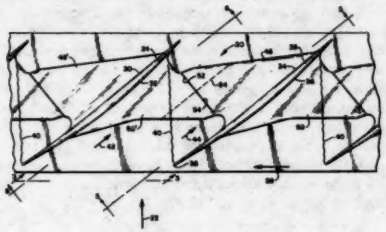
a plurality of circumferentially spaced coplanar airfoil blades mounted on said shaft, each having a pressure surface side and a suction surface side;

an intermediate part span shroud for resisting twisting and for damping vibration of said blades;

said shroud comprising a circumferentially extending fin on each of each blade, the fins of adjacent blades in abutting relationship;

said fins of elongated streamlined shape and extending at an

angle with the axis of said rotor shaft in the direction of airflow; and



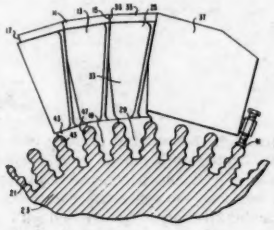
said fins having a greater angle toward the pressure surface side of each blade and a lesser angle toward the suction surface side of each blade.

4,798,520

METHOD FOR INSTALLING INTEGRAL SHROUD TURBINE BLADING

Albert J. Partington, Winter Springs, Fla., and David A. Hornberger, Waxhow, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 22, 1987, Ser. No. 53,246
Int. Cl.[4] F01D 5/32
U.S. Cl. 416—219 R **10 Claims**



1. A method of installing a row of blades on a turbine rotor with a blade anchor, each of the blades having a root portion, a blade portion extending from the root portion, a platform interposed between the root portion and the blade portion and an integrally fromed shroud segment extending from the blade portion, each shroud segment including a leading edge and a trailing edge, the blade anchor having a blade support member extending from a root portion and an end portion with a trailing surface positionable against the leading edge of a blade shroud segment, the rotor having a plurality of steeple shaped grooves circumferentially disposed about the rotor for receiving the root portion of the blades and the root portion of the blade anchor, said method comprising the steps of:

installing a removable blade anchor in a first groove;

installing a plurality of turbine blades circumferentially about the rotor by sequentially wedging each of the blades in registry with a corresponding one of the grooves so that each shroud segment tightly abuts an adjacent shroud segment and all shroud segments are forced toward the blade anchor, the installation beginning at a groove closest to the trailing surface of the blade anchor end portion and ending prior to the installation of a blade in the remaining vacant groove next to the anchor blade support;

rewedging a first portion of the plurality of blades extending from the trailing surface of the blade anchor end portion to force shroud segments on the first portion of blades away from the blade anchor while each shroud segment remains in tight abutment with each adjacent shroud segment so that the blade anchor may be removed without disturbing the tight abutment between shroud segments;

removing the anchor blade after rewedging the first portion of blades; and

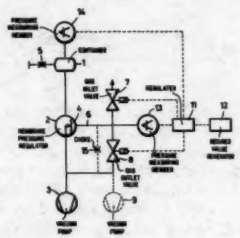
installing additional blades in the rotor to form a complete row of blades.

4,798,521

SYSTEM AND METHOD FOR REGULATING PRESSURE IN A CONTAINER

Lothar Schmidt, Kerpen-Sindorf, and Hans-Joachim Schumbert, Wesseling, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed May 4, 1987, Ser. No. 45,492
Claims priority, application European Pat. Off., May 2, 1986, 86106040.8
Int. Cl.[4] F04B 49/06; F16K 31/12
U.S. Cl. 417—295 **9 Claims**



1. In a system for regulating pressure in a container and having a membrane pressure regulator with a reference pressure chamber containing a reference pressure and a vacuum pump connected to the container via the membrane pressure regulator, the improvement comprising:

a gas inlet valve connected to said reference pressure chamber for increasing the reference pressure;

a pressure decreasing means connected to said reference pressure chamber for decreasing the reference pressure; and a

regulator means connected to said gas inlet valve and said pressure decreasing means for actuating said valve and said pressure decreasing means, said regulator means including a desired value generating input means for generating a desired pressure value for said container and measuring means including a first measuring member connected to the container for measuring the pressure in the container and a second measuring member connected to the reference pressure chamber for measuring the pressure in the reference pressure chamber.

4,798,522

JOINT STRUCTURE FOR FLUID SUPPLY PUMP AND FLUID SUPPLY PIPE

Hideki Kaga, Kariya, and Hisanori Kobayashi, Chita, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 4, 1986, Ser. No. 938,145
Claims priority, application Japan, Dec. 4, 1985, 60-273094
Int. Cl.[4] F04B 39/12
U.S. Cl. 417—363 **10 Claims**

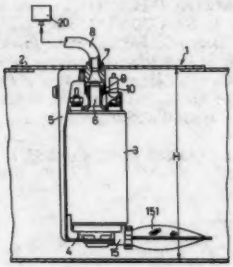
1. A joint structure for a fluid supply pump and a fluid supply pipe comprising:

an outlet pipe projecting from a pump housing of said fluid supply pump;

a cylindrical retaining member fitted on an outer periphery of said outlet pipe, the length of said cylindrical retaining member being less than the length of said outlet pipe, thereby exposing a tip end portion of said outlet pipe;

a O-ring closely fitted on an outer periphery of said tip end portion of said outlet pipe so that said cylindrical retaining member contacts said O-ring at its upper end, and contacts an upper end surface of said pump housing at its lower end; and

a cylindrical joint member to which one end of a fluid supply pipe is connected and communicating with said supply



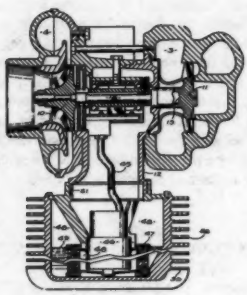
pipe; said outlet pipe being pressed into said joint member; said joint member having an inner diameter that is larger than the outer diameter of said outlet pipe and the outer diameter of said O-ring so that an outer periphery of said O-ring closely contacts an inner periphery of said joint member while said O-ring is retained by and in contact with said cylindrical retaining member when said outlet pipe is pressed into said joint member.

4,798,523

TURBOCHARGER BEARING AND LUBRICATION SYSTEM

Jerry Glaser, Playa del Rey, and David G. Elpern, Los Angeles, both of Calif., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 19, 1986, Ser. No. 944,498
Int. Cl.[4] F04B *17/00, 35/04*
U.S. Cl. 417—407 **27 Claims**



1. A turbocharger comprising:

a turbine, having a turbine wheel within a turbine housing;

a compressor, having a compressor wheel within a compressor housing;

a shaft extending between said turbine wheel and said compressor wheel;

a center housing disposed between said turbine housing and said compressor housing and disposed around said shaft and including bearing means, supported by a bearing bore, to rotatably support said shaft;

lubrication means, separate from said internal combustion engine lubrication system, to lubricate said bearing means, and

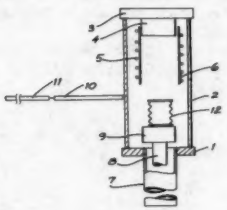
air ventilation means comprising an inner race, surrounding said shaft, an air slinger, mounted on said inner race, freely rotatable within said main housing and a multiplicity of ribs, mounted in the annular space between said shaft and said inner race, and parallel to the axis of said shaft, to allow air flow longitudinally along said shaft in the annular space between the outer surface of said shaft and the inner surface of said inner race, said inner race having one or more apertures near the end of said shaft opposite said air slinger, to permit entry of air into the annular space between said shaft and said inner race, to facilitate air flow for cooling said shaft.

4,798,524

APPARATUS FOR FORMING CERAMICS

Eric J. Ramm, Lilli Pilli, Australia, assignor to Australia Nuclear Science & Technology Organisation, Australia

Filed Dec. 1, 1986, Ser. No. 936,161
Claims priority, application Australia, Nov. 29, 1985, PH03649
Int. Cl.[4] B29C *43/52*
U.S. Cl. 425—77 **11 Claims**



1. An apparatus for hot uniaxial pressing of heat resistant metal canisters containing synthetic rock components, the canisters having a generally cylindrical wall incorporating bellows-like formations, the apparatus characterised by a hydraulic press having an upwardly acting ram with a refractory facing thereon for supporting the bottom of the canister, a fixed top abutment, a heating zone immediately below the abutment and adapted to surround the canister during the hot uniaxial pressing process and a retractable platen adapted to be inserted laterally into the press below the heating zone such that a canister can be placed on the refractory facing and partially compressed at ambient temperature by upward displacement of the hydraulic press, the platen being removable to permit the press to be displaced upwardly to a higher level whereby the bellows-like canister is inserted within the heating zone and abuts against the top abutment.

4,798,525

CASTING INSTALLATION

Kimiteru Sato, and Haruyuki Ito, both of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan

Filed Aug. 5, 1987, Ser. No. 81,748
Claims priority, application Japan, Aug. 8, 1986, 61-186242
Int. Cl.[4] B28B *1/26*
U.S. Cl. 425—84 **16 Claims**

1. A casting installation for casting slip into a ceramic product, said casting installation comprising:

a pressure container,

an inner surface of said pressure container defining an opening extending through said pressure container,

at least one casting mold adapted to be located in said opening of said pressure container so as to establish a space which surrounds said at least one casting mold,

said casting mold being composed of a plurality of separate

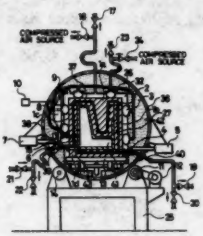
mold parts each having a plurality of channels therein and having its respective outer face treated to be fluid-tight,

an inner molding surface of said mold parts, when assembled, being dimensioned to define a molding cavity of said at least one casting mold,

said space being in communication with said molding cavity of said at least one casting mold,

means for firmly clamping said at least one casting mold,

means operatively connected to said channels of said mold parts for depressurizing said mold parts,



a source of slip operatively connected to said molding cavity of said at least one casting mold,

a source of fluid operatively connected to said space surrounding said at least one casting mold, and

auxiliary slip supply reservoir means connected between said space surrounding said at least one casting mold and said molding cavity for supplying additional slip to said molding cavity.

4,798,526

MODULAR EXTRUSION HEAD

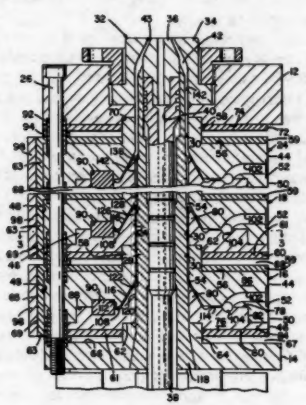
Milton Briggs, York, Pa., and Erich O. Teutsch, Marietta, Ga., assignors to General Electric Company and Graham Engineering Corporation

Continuation of Ser. No. 886,734, Jul. 17, 1986, abandoned, and a continuation of Ser. No. 878,701, Jun. 26, 1986, abandoned.

This application Oct. 23, 1986, Ser. No. 922,198

Int. Cl.[4] B29C *47/06, 47/26, 47/28, 47/78*

U.S. Cl. 425—113 **36 Claims**



1. A modular extrusion head for extruding parisons of synthetic, polymeric resins, which comprises;

(A) a plurality of die block modules assembled in a stack having first and second ends to form a die body for the head, each of the die block modules comprising:

(1) an upper die plate, having

(i) an upper surface;

(ii) a lower surface;

(iii) a peripheral edge defining the outer perimeter of the plate and extending between the upper surface and the lower surface; and

(iv) a bore providing open communication between the upper and lower surfaces; and

(2) a lower die plate, having

(i) an upper surface;

(ii) a lower surface;

(iii) a peripheral edge defining the outer perimeter of the lower die plate and extending between the upper surface and the lower surface; and

(iv) a bore providing open communication between the upper surface and the lower surface of the lower die plate;

the lower surface of the upper die plate and the upper surface of the lower die plate being adapted by size and configuration to mate with each other and form therebetween a thermoplastic resin melt distribution channel;

said upper die plate and lower die plate being removably assembled together whereby the channel is formed and the bore of the upper die plate is in axial alignment with the bore of the lower die plate, forming a segment of an extrusion channel of substantially uniform diameter piercing the die block assembly;

the segments of the plurality of assembled modules together forming a continuous extrusion channel of substantially uniform diameter, open at top and bottom of the module assembly and open into each distribution channel of each module in the assembled modules through an annular orifice about the aperture;

each of said resin melt distribution channels being radially disposed about the periphery of the extrusion channel segment and extending distally from the periphery of the extrusion channel to a line describing a circle;

(B) melt supply means between a melt source and each distribution channel for supplying melted, synthetic, thermoplastic, polymeric resin to the channel under uniform pressure;

(C) temperature control means associated with each module for maintaining a pre-determined resin temperature in each module;

(D) means for maintaining the plurality of stacked modules in sealing association with each other;

(E) a first terminal die plate for capping a first end of the stack;

(F) a second terminal die plate for capping the second end of the stack;

(G) a mandrel fixed in the extrusion channel and having a first end, a second end and a tapered body joining together the first and second ends thereof, said tapered body being spaced apart from the modules forming the extrusion channel to form an extrusion passageway in open communication with the annular orifice opening into each distribution channel; and

(H) fluid conduit means passing through the central portion of the mandrel.

4,798,527

CONTROL SYSTEM FOR INJECTION MOLDING MACHINE

Rajamouli Gunda, Rochester Hills, Mich., assignor to Vickers, Incorporated, Troy, Mich.

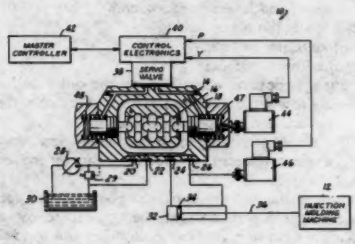
Filed Mar. 7, 1988, Ser. No. 164,957

Int. Cl.[4] B29C *45/77, 45/82*

U.S. Cl. 425—145 **16 Claims**

1. An electrohydraulic servo system for controlling pressure of fluid in a cavity of undetermined volume, said system comprising:

valve means including a valve element, means for supplying fluid to said cavity as a function of position of said valve element, and means responsive to electronic valve control signals for controlling position of said valve element, and electronic valve control means including means for providing a pressure command signal Pc as a function of desired pressure of fluid in said cavity, means coupled to said valve means for providing an electronic pressure feedback



signal P as a function of fluid pressure in said cavity, means for varying said pressure feedback signal as a function of a gain Kp, means for providing said valve control signal as a function of a difference between said pressure command signal Pc and said varied pressure feedback signal multiplied by a gain Ke, means for determining volume V of said cavity, and means for varying said gain Ke as a function of volume of said cavity.

4,798,528

EXTRUDING DIE STRUCTURE FOR PLUNGER MOLDING MACHINE

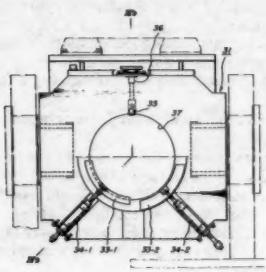
Isao Hattori, Nagoya, and Hifuo Noiri, Gifu, both of Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

Continuation of Ser. No. 917,542, Oct. 10, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 149,949

Claims priority, application Japan, Oct. 21, 1985, 60-159847[U]

Int. Cl.[4] B29C 47/00

U.S. Cl. 425—190 **1 Claim**



1. An extruding die structure for a plunger molding machine, comprising: an extruding die structure body detachably mounted on an extruding die mounting portion of said plunger molding machine and having an extruding die at its front end, said extruding die structure body having a fixing groove formed in an outer circumference of said die body structure for fixing said extruding die structure body to said extruding die mounting portion and a positioning groove formed in an outer circumference of said die body structure for positioning said extruding die structure body in phase with said extruding die mounting portion, the positioning groove being located between said fixing groove and said extruding die, keys engaging said positioning and fixing grooves for positioning and fixing the structure body, and key driving means provided in the extruding die mounting portion for engaging and disengaging said keys from said positioning and fixing grooves of said extruding die structure body.

4,798,529

APPARATUS AND METHOD FOR BRIQUETTING FIBROUS CROP OR LIKE MATERIALS

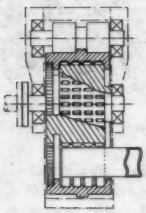
Wilfred E. Klinner, Milton Keynes, England, assignor to National Research Development Corporation, London, England

Filed Apr. 9, 1986, Ser. No. 849,942

Claims priority, application United Kingdom, Apr. 9, 1985, 8509061

Int. Cl.[4] B29C 43/08

U.S. Cl. 425—289 **14 Claims**



1. For forming fibrous crop or like materials into self-supporting products, an apparatus comprising:

first and second rotary compression members arranged so that opposed annular closing faces of the compression members cooperate to define the principal pressure-generating surfaces of a compression space for a charge of the materials;

a plurality of axially-aligned longitudinal rib protrusions extending radially from the closing face of a first one of said compression members to abut the closing face of the second one of said compression members and to define axially parallel first walls of the compression space;

a plurality of axially-spaced circumferential rib protrusions extending radially from the other of said opposed closing faces to abut the closing face of said first compression member and to define axially transverse second walls of the compression space;

at least some respective rib protrusions of one of said plurality of axially-aligned longitudinal rib protrusions and said plurality of axially-spaced circumferential rib protrusions being interrupted at corresponding sites along the length thereof to provide a plurality of rows of gaps, and respective rib protrusions of the other of said plurality of axially-spaced circumferential rib protrusions and axially-aligned longitudinal rib protrusions extending through respective ones of said rows of gaps;

generally tapering projections extending into the space bounded by said longitudinal and circumferential rib protrusions, but to a lesser extent that said protrusions; and

drive means operative to rotate the two compression members in opposite rotational senses to one another;

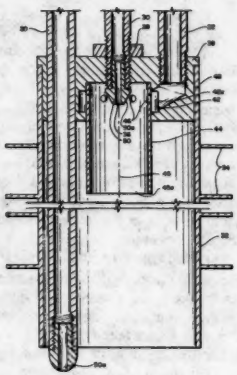
said longitudinal and circumferential rib protrusions being tapered towards their radially outer edges so as, in operation of the apparatus, to combine with said closing faces of the compression members and with said generally tapering projections to apply pressure having components in three mutually orthogonal directions at and within the perimeter of the charge, thereby to produce in the charge zones of relatively high bond strength which limit subsequent relaxation of the charge to maintain a relatively high charge density.

4,798,530

NOZZLE ASSEMBLY FOR HOT AIR TORCH

Arvo M. Sestrap, 212-1521 Blackwood Street, White Rock, B.C., Canada V4B 3V6

Filed Apr. 21, 1987, Ser. No. 40,875
Int. Cl.[4] F23D *13/62*
U.S. Cl. 431—354 12 Claims



1. A nozzle assembly having a longitudinal center axis, a front end and a back end particularly adapted for use in a hot air torch wherein the hot air torch utilizes a source of compressed air and a source of gaseous fuel comprising:

(a) a base structure;

(b) a circumferential housing having a front open end and a rear end, the housing having a lengthwise axis which is aligned with the longitudinal center axis of the nozzle assembly, the housing comprising a circumferential side wall which extends around the longitudinal axis and defines a primary combustion chamber;

(c) a nozzle member located at the rear end of the housing and centered on the longitudinal axis of the nozzle assembly, the nozzle member having a front forwardly facing portion with a center through opening, the opening having a front end which faces from the nozzle member in a forward direction along the longitudinal axis of the nozzle assembly so as to discharge fuel in a forward direction through the combustion chamber, the nozzle member being characterized in that the nozzle member has a generally frusto-conical exterior side surface which slopes inwardly and forwardly to terminate at the front end of the center through opening;

(d) an annular air discharge structure located at the rear end of the housing and defining an annular plenum chamber to receive pressurized air therein, the structure having a plurality of radially inwardly directed air jet openings positioned circumferentially around the nozzle member to direct air from the plenum through the air jet openings in a converging radially inward direction toward the nozzle member; and

(e) the nozzle member and the air discharge structure being positioned such that air jets discharged from the air jet openings converge at and impinge upon the frusto-conical exterior side surface of the nozzle member, with the air jets being a primary source of combustion air for the fuel discharged from the nozzle member,

whereby as air is directed from the air discharge structure through the air jet openings and flows radially inwardly toward the nozzle member and as gaseious fuel flows from the nozzle opening, the air strikes the frusto-conical exterior side surface of the nozzle member in a manner that the air combines effectively with the gaseous fuel to mix the air with the gaseous fuel providing effective combustion.

7. A method of providing effective combustion in a hot air torch with a nozzle assembly, the nozzle assembly having a longitudinal center axis, a front end and a back end wherein the hot air torch utilizes a source of compressed air and a source of gaseous fuel, comprising the steps of:

(a) providing a base structure;

(b) providing a circumferential housing having a front open end and a rear end, the housing having a lengthwise axis which is aligned with the longitudinal center axis of the nozzle assembly, the housing comprising a circumferential side wall which extends around the longitudinal axis and defines a primary combustion chamber;

(c) providing a nozzle member;

(d) positioning the nozzle member at the rear end of the housing and centering the nozzle member on the longitudinal axis of the nozzle assembly;

(e) providing the nozzle member with a front forwardly facing portion with a center through opening, the opening having a front end which faces from the nozzle member in a forward direction, the nozzle member being characterized in that the nozzle member has a generally frusto-conical exterior side surface which slopes inwardly and forwardly to terminate at the front end of the opening;

(f) providing an annular air discharge structure defining an annular plenum chamber to receive pressurized air therein, the air discharge structure having a plurality of radially inwardly directed air jet openings positioned circumferentially around the nozzle member to direct air from the plenum through the air jet openings in a converging radially inward direction toward the nozzle member;

(g) positioning the annular air discharge structure at the rear end of the housing;

(h) positioning the nozzle member and the air discharge structure such that air jets discharged from the air jet openings converge at and impinge upon the frusto-conical exterior side surface of the nozzle member;

(i) directing air from the air discharge structure through the air jet openings whereby the air flows radially inwardly toward the nozzle member with the air jets being a primary source of combustion air for the fuel discharged from the nozzle member; and

(j) directing gaseous fuel flow from the source of gaseous fuel whereby air strikes the frusto-conical exterior side surface of the nozzle member and combines effectively with the gaseous fuel to mix the air with the gaseous fuel providing effective combustion.

4,798,531

PROCESS AND APPARATUS FOR THE CONTROL OF THE AIR AND FUEL SUPPLY TO A PLURALITY OF BURNERS

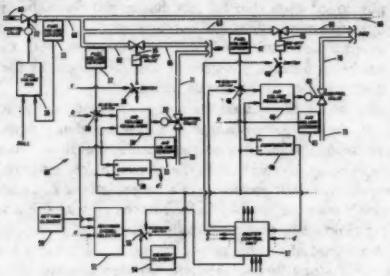
Kurt Breckner, Walblingen, Fed. Rep. of Germany, assignor to Eckardt AG, Stuttgart, Fed. Rep. of Germany

Filed Jul. 28, 1987, Ser. No. 78,809

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638410

Int. Cl.[4] F23N *1/02*

U.S. Cl. 431—12 2 Claims



1. A process for controlling the supply of air and fuel to at least three burners, comprising the steps of:

(A) providing separate fuel lines for said burners and a common fuel supply conduit means which supplies fuel to all of said fuel lines, the volume of fuel supplied through said common fuel supply conduit means being regulated by a fuel volume regulator,

(B) providing separate air-carrying lines for said burners, the volume of air supplied through said air-carrying lines being regulated by respective adjustable air volume regulators for said air-carrying lines,

(C) supplying a predetermined volume of fuel and a predetermined volume of air to a first of said burners through a first fuel line and a first air-carrying line, respectively, said fuel volume being regulated by said adjustable fuel volume regulator, and said air volume being regulated by a first of said adjustable air volume regulators, with remaining ones of said fuel lines being kept closed,

(D) thereafter providing a signal to said first adjustable air volume regulator in accordance with the actual volume of fuel supplied to said first burner to accordingly adjust the volume of air supplied to said first burner,

(E) thereafter providing a signal to a second of said adjustable air volume regulators in accordance with the adjusted volume of air supplied to said first burner to supply to a second of said burners a volume of air substantially the same as the volume of air being supplied to said first burner,

(F) thereafter opening a second of said fuel lines for said second burner and actuating said fuel volume regulator to conduct double said predetermined volume of fuel through said fuel supply conduit means, whereby said predetermined volume of fuel is supplied to each of said first and second burners, with remaining ones of said fuel lines other than said first and second fuel lines being kept closed,

(G) thereafter providing a signal to said second adjustable air volume regulator in accordance with the actual volume of fuel supplied to said second burner to accordingly adjust the volume of air supplied to said second burner,

(H) thereafter providing a signal to at least one additional adjustable air volume regulator in accordance with the largest of said adjusted volumes of air supplied to said already-ignited burners to supply to an additional one of said burners a volume of air substantially the same as said largest volume,

(I) thereafter opening said fuel line for said additional burner and actuating said fuel volume regulator to supply triple said predetermined volume of fuel through said fuel supply conduit means, whereby said predetermined volume of fuel is supplied to each of said first, second, and additional burners, and

(J) thereafter providing a signal to said additional adjustable air volume regulator in accordance with the actual volume of fuel supplied to said additional burner to accordingly adjust the volume of air supplied to said additional burner.

4,798,532

FLASH SMELTING FURNACE

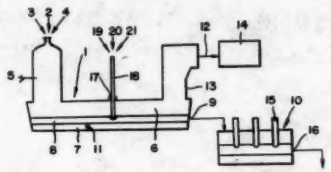
Takayoshi Kimura; Yasuo Ojima, and Yoshiaki Mori, all of Niihama, Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Continuation of Ser. No. 900,698, Aug. 27, 1986, abandoned. This application Oct. 26, 1987, Ser. No. 113,400

Claims priority, application Japan, Sep. 5, 1985, 60-197433

Int. Cl.[4] F26B *3/00*; F27B *19/02*

U.S. Cl. 432—210 2 Claims



1. In a flash smelting furnace for producing matte from a copper or nickel sulfide ore comprising a reaction shaft, a concentrate combustion device disposed at a top of said reaction shaft, means for supplying oxidizing gas to said top of said reaction shaft, means for supplying powdered copper or nickel sulfide ore concentrate to said top of said reaction shaft, a settler for containing melt formed in said reaction shaft and having opposite first and second ends and a ceiling, said first end of said settler being connected to a lower part of said reaction shaft, and an uptake connected to said second end of said settler, the improvement wherein said flash smelting surface includes at least one consumable lance pipe extending downwardly through the ceiling of said settler between said furnace shaft and said uptake, means for supplying powdery raw material which includes copper or nickel sulfide ore concentrate to each of said lance pipes for discharge against said melt in said settler, means for simultaneously supplying a reaction gas to each of said lance pipes for discharge against said melt in said settler, and means connected to each of said lance pipes to move the associated lance pipe downwardly into said settler as a lower end thereof in said settler is consumed.

4,798,533

ASPHALT RECYCLING CONVEYOR

Jerry R. Collette, P.O. Box 1482, Englewood, Fla. 34295-1482

Filed Jun. 6, 1988, Ser. No. 202,453

Int. Cl.[4] F27D *3/00*

U.S. Cl. 432—227 11 Claims

1. An asphalt recycling conveyor system comprising:

a laterally extending, horizontally disposed, collecting trough having a semicircular bottom, a front wall, a back wall and end walls;

a collecting trough hopper secured to said bottom of said collecting trough at one end thereof;

an auger having a shaft rotatably mounted in said collecting trough;

said auger having a thread directed to move asphalt in said collecting trough toward said collecting trough hopper;

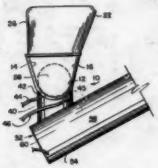
a drive operably connected to said auger for rotation thereof;

a plurality of heating lines substantially coextensive with said collecting trough in heat transfer relationship with said bottom of said collecting trough;

a layer of thermal insulation on said bottom of said collecting trough;

a protective cover over said layer of thermal insulation;

a back deflecting plate upwardly extending from said back wall;



end deflecting plates upwardly extending from said end walls; and

spaced guard rails extending across said collecting trough, whereby partially cooled asphalt can be deposited in said trough through said guard rails from a dump truck and caused to pass through said collection hopper for recycling.

4,798,534

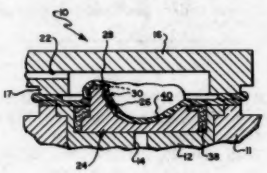
METHOD OF MAKING A DENTAL APPLIANCE

Peter R. Breads, Buffalo, N.Y., assignor to Great Lakes Orthodontic Laboratories Inc., Tonawanda, N.Y.

Continuation of Ser. No. 637,577, Aug. 3, 1984, abandoned. This application Oct. 24, 1986, Ser. No. 922,758

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—6 **9 Claims**



1. A method of making a dental appliance comprising:

providing a dental model formed from an impression taken from the mouth of the patient, said model including a teeth simulating portion and a tissue simulating portion;

positioning an auxiliary member in relationship to said model so that a substantial and continuous portion of said auxiliary member is spaced a predetermined distance from a surface of said model along said tissue simulating portion and another portion of the auxiliary member acts on said tissue simulating portion of said model to maintain the spacing of said substantial and continuous portion from said model surface along said tissue simulating portion so that a gap separates said substantial and continuous portion from said model surface along said tissue simulating portion, said substantial and continuous portion being uncoated;

applying only heated thermoplastic material to said model so as to overlie said model and said auxiliary member, said thermoplastic material being pliable while in its heated condition;

shaping said heated thermoplastic material so that said material conforms to the shape of said model and portions of said material are urged to flow around said spaced portion of said auxiliary member and join together to encapsulate said spaced portion for a substantial distance along its length, said thermoplastic material being of the type which normally must be urged into said gap separating said substantial and continuous portion from said model surface; and

permitting said thermoplastic material to cool to a hardened condition whereby said auxiliary member is firmly secured to the cooled thermoplastic material.

4,798,535

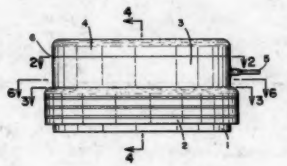
FOOT REGULATOR, ESPECIALLY FOR DENTAL EQUIPMENT

Benny S. Nielsen, Pilegaardsv10 nge 191, DK-2635 Isboj, Denmark

Filed Mar. 24, 1986, Ser. No. 843,111

Int. Cl.[4] A61C *1/02*

U.S. Cl. 433—101 **4 Claims**



1. A foot regulator of substantially cylindrical shape, for controlling multiple operations upon adjustment; said foot regulator comprising:

(a) concentric control means (2) including a control member mounted for selective rotation about a vertical axis and for selective horizontal displacement, in all radial directions normal to said vertical axis, from a center position;

(i) said control member having a plurality of radially-spaced openings (10) therein and a plurality of spring members, at least one each of which is mounted in each radiallyspaced opening;

(ii) said control member having an upper side with a central recess therein;

(b) rotational sensing means for sensing rotational positioning of said control means relative to said vertical axis;

(c) horizontal displacement sensing means constructed and arranged to detect horizontal displacement of said control member from said center position;

(i) said horizontal displacement sensing means including a ball positioned within said central recess;

(ii) said foot regulator including a housing having a through-hole therein; said throughhole being aligned coaxially with said control means central recess;

(iii) said horizontal displacement sensing means including a pressure switch in communication with said ball by means of said through-hole; and,

(d) a plurality of pins mounted in said regulator, at least one each of which extends into one each of said radially-spaced openings in said control member;

(i) said spring members mounted to extend between said pins and said control member to selectively bias said control member into said center position;

(e) whereby as said control member is horizontally displaced, said ball is displaced at least partially from said recess to activate said pressure switch, said pressure switch being usable to control a first operation; and,

(f) whereby rotational positioning of said control member can be measured by said rotational sensing means for control of a second operation.

4,798,536

HIGH STRENGTH FELDSPATHIC DENTAL PORCELAINS CONTAINING CRYSTALLINE LEUCITE

Sigmund Katz, West Orange, N.J., assignor to American Thermocraft Corp., East Orange, N.J.

Continuation-in-part of Ser. No. 50,011, May 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 945,834, Dec. 23, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 124,459

Int. Cl.[4] A61C *13/08, 13/083;* C03C *10/10*

U.S. Cl. 433—212.1 13 Claims

7. A translucent feldspathic dental porcelain restoration exhibiting a minimum crystalline leucite content of about 45% by weight, wherein said leucite crystallites exhibit a size of less than about 35 microns; a compressive strength of at least about 125,000 p.s.i.; a diametral tensile strength of at least about 6,000 p.s.i.; and a flexural strength of at least about 16,000 p.s.i.; said restoration consisting essentially of a translucent feldspathic dental porcelain comprising:

Component	Percentage (by weight)
SiO_2	55–70
Al_2O_3	16–20
CaO	0.5–5.0
MgO	0.5–5.0
Li_2O	1.0–5.0
Na_2O	2.0–5.0
K_2O	12.5–22.5
Ce_2O_3	0–1.0

4,798,537

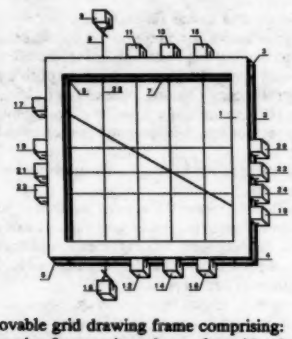
MOVABLE GRID DRAWING FRAME

Perry N. Ragouzis, 1030 Gregory Road, Fort Collins, Colo. 80524

Filed Feb. 29, 1988, Ser. No. 161,679

Int. Cl.[4] G09B *11/00*

U.S. Cl. 434—90 3 Claims



1. A movable grid drawing frame comprising:

a flat drawing frame unit made up of two identical four sided flat frames; four thin spacers positioned at the four corners of said individual flat frames so as to separate the frames enough to provide a narrow slot between them, said slot being uninterrupted along the full length of each edge of said drawing frame unit, except at the corners where the thin spacers connect the individual flat frames together into a single unit.

a number of individual elastic grid strings inserted through the narrow slots created between the two individual flat frames, said elastic grid strings to span, vertically and horizontally, the open area contained by the four inside edges of the drawing frame unit;

two aliders, bead or button like units, per installed grid string, one attached to each end of each individual grid string so that all grid strings are stretched under slight tension between the outside edges of the drawing frame unit, said sliders riding on the outside edges of said drawing frame unit.

4,798,538

ABDOMINAL RESPIRATION TRAINING SYSTEM

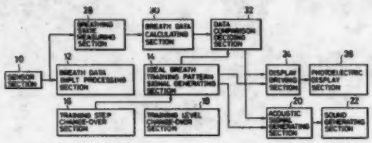
Hiroshi Yagi, Toyama, Japan, assignor to Elco Co., Ltd., Toyama, Japan

Filed May 26, 1987, Ser. No. 53,760

Claims priority, application Japan, May 27, 1986, 61-121853

Int. Cl.[4] A61B *5/02*

U.S. Cl. 434—262 6 Claims



1. An abdominal respiration training system comprising:

a sensor which is attached to an abdominal region of a person to be examined and detects the motion of the abdominal wall by an abdominal respiration;

a training pattern generating means for generating an ideal pattern of an inspiration time and/or an expiration time on the basis of ideal values of a respiration ratio, a respiration depth, and a number of respiration times, so as to obtain a relaxation state in which an alpha wave mainly appears;

a breath pattern calculating means for calculating an actual breath pattern of the person to be examined from a detection signal of said sensor;

a comparison deciding means for comparing the pattern calculated by said breath pattern calculating means with the ideal breath training pattern from said training pattern generating means, and for deciding a degree of similarity between said calculated pattern and said ideal breath training pattern; and

an informing means for informing said ideal breath training pattern and an output of said decision indicative of the degree of similarity to the person to be examined by an acoustic output and/or photoelectric display.

4,798,539

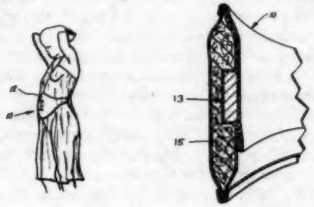
PRENATAL LEARNING DEVICE AND METHOD

Verlyn Henry, and Danise Henry, both of 8130 Kendaville Rd., Lakeview, Mich. 48850

Filed Mar. 26, 1987, Ser. No. 30,344

Int. Cl.[4] G09B *50/004*

U.S. Cl. 434—319 25 Claims



1. A method for educating and communicating with a fetus in its mother's womb comprising:

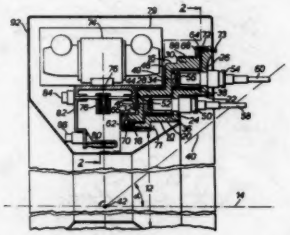
mounting a sonic source means for transmitting a communication to a fetus in its mother's womb in a support and positioning means, and securing said support and positioning means to a mother with said sonic source means located adjacent to and in sonic vibration transmitting relation to the mother's womb; and

transmitting a desired communication in sonic wave form into the womb from said sonic source means.

4,798,540
INTEGRATED CT SCANNER GANTRY

Richard T. Bernardi, Prospect Heights, Ill., assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Division of Ser. No. 494,104, May 12, 1983. This application Mar. 3, 1988, Ser. No. 163,805
Int. Cl.[4] G03B 41/16; H01R 39/10
U.S. Cl. 439—22 3 Claims



1. A gantry assembly comprising:

a. a stator having:

i. first and second cylindrical band sections coaxial to the axis of rotation of said assembly and offset from one another along said axis of rotation, said first band section having a smaller diameter than said second band section, yet having a diameter sufficient to encircle a patient positioned along said axis of rotation; and

ii. first and second disc sections lying in planes perpendicular to said axis of rotation, said first disc section extending from one edge of said first band section to one edge of said second band section, and said second disc section extending from the other edge of said second band section in a direction away from said axis of rotation;

b. a rotor having:

i. first and second cylindrical band sections aligned with and coaxial to said first and second band sections of said stator, respectively, the diameters of said first and second band sections of said rotor being greater than the diameters of said first and second band sections of said stator, respectively, to form respective first and second annular cavities therebetween with said first disc section of said stator closing off one side of said first cavity and said second disc section of said stator closing off one side of said second cavity; and

ii. first and second disc sections lying in planes perpendicular to said axis of rotation, said first disc section extending from one side of said first band section of said rotor to close off the other side of said first cavity and said second disc section extending from the other edge of said first band section of said rotor to one edge of said second band section of said rotor to close off the other side of said cavity;

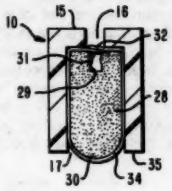
c. a bearing assembly located between said stator and said rotor to rotatably support said rotor on said stator; and

d. first and second slip ring means mounted in part on said stator and in part on said rotor and exending into said first and second cavities, respectively, for effecting high voltage connection from said stator to said rotor while permitting continuous rotation of said rotor.

4,798,541
RIGHT ANGLE ELECTRICAL CONNECTOR

Warren W. Porter, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 2, 1987, Ser. No. 92,860
Int. Cl.[4] H05K 1/00
U.S. Cl. 439—67 9 Claims



1. A right angle connector for connecting a mother board to a daughter board comprising:

a housing defining a chamber and having a first slot therein communicating with said chamber;

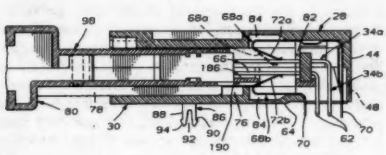
an elastomeric member, having a second slot therein in register with said first slot, disposed in said chamber and having a portion extending out of said chamber; and

flexible circuit means folded around said elastomeric member having its free ends located in said second slot; such that, electrical contact is made between edge connector pads on the daughter board inserted into said first and second slots and the conductors on said flexible circuit, and electrical contact is made between connector pads of the mother board and a portion of said flexible circuit surrounding said extending portion of said elastomeric member extending from the housing as said housing is fastened to the mother board compressing said elastomeric member making a tight engagement therebetween.

4,798,542
SWITCHING CONNECTOR

John C. Asick, Harrisburg; John M. Landis, Camp Hill, and Stephen M. Yingst, Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 39,559, Apr. 16, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 183,548
Int. Cl.[4] H01R 13/627
U.S. Cl. 439—188 9 Claims



1. A connector system comprising:

a header assembly having a mounting face and an insulative housing defining a cavity;

a plurality of pin contacts having a first end extending from the mounting face and a second end extending into the cavity;

a receptacle assembly having a mating face and an insulative housing;

a plurality of terminals mounted in the receptacle assembly, said terminals mounted in the receptacle assembly, said terminals having a mating portion directed toward the mating face for mating with said pin contacts, and a terminating portion directed away from the mating face for terminating conductors of a cable; and

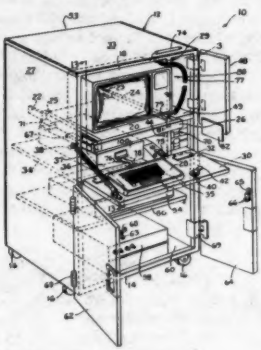
a plurality of spring contacts in said header assembly, said spring contacts having a first end and a second end, said first end extending from the mounting face and capable of being connected to independent circuits, each of said second ends in biased engagement with said second end of only one corresponding pin contact when the header assembly and a receptacle assembly are not mated, said second end of said spring contacts deflected out of engagement with said second end of a corresponding pin contact by said receptacle housing when the header assembly and receptacle assembly are mated, whereby upon mating of said header and receptacle assemblies, said receptacle assembly housing causes said second end of said spring contacts to break electrical engagement with said second end of corresponding pin contacts, which disconnects the independent circuits from the pin contacts.

4,798,543

INTERACTIVE TRAINING METHOD AND SYSTEM

Rickey J. Spiece, Park Ridge, Ill., assignor to Bell & Howell Company, Skokie, Ill.

Filed Mar. 31, 1983, Ser. No. 481,090
Int. Cl.[4] G09B *5/00*
U.S. Cl. 434—323 **33 Claims**



1. Interactive information apparatus comprising:
program control means for controlling the presentation of information and for receiving inputs from operators;
first operator entry means for inputting response information to said program control means and being accessible to a first category of instructor users of the apparatus; and
second entry means for inputting information to said program control means and being accessible to a second category of learner users and wherein said first operator entry means is inaccessible to said second category of learner users, said second entry means including operable entry means and means for limiting access to said operable entry means.

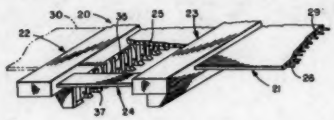
4,798,544

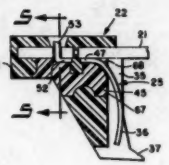
LOW PROFILE CLIP CONNECTOR WITH INTEGRAL CONTACT SUPPORT INSERT

John Hartman, Painesville, Ohio, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 816,415, Jan. 6, 1986, Pat. No. 4,726,115. This application Oct. 23, 1987, Ser. No. 112,815
Int. Cl.[4] H01R *9/07, 11/20*
U.S. Cl. 439—404 **23 Claims**

1. An electrical connector comprising an electrical cable including plural electrical conductors, and at least one connector body including therein plural electrical contacts having exposed contacting portions for engaging electrical leads of an external electrical device and coupling portions for piercing the cable insulation to become electrically connected at cable insulation displacement junctions to said conductors of said cable, said body including insert means for supporting thereagainst said contacts in proper position and balance forming body means molded to at least a part of each of said insert means, contacts and cable to form therewith an integral structure and securely to hold said contacts to said insert means in proper position , said contacts having base portions joining together respective contacting and coupling portions, said base portions being supported against said insert means at parts thereof extending between said contacting and coupling portions in a direction generally perpendicular to said coupling portions, and said coupling portions extending away from said insert means.



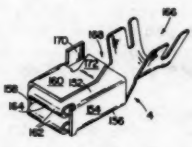


4,798,545

ELECTRICAL TERMINAL RECEPTACLE AND ELECTRICAL COMPONENT HOUSING ADAPTED FOR THE SAME

Dhirendra C. Roy, Canton; Roosevelt Johnson, Detroit, and Gregory J. Balazich, Westland, all of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Sep. 23, 1987, Ser. No. 100,155
Int. Cl.[4] H01R *13/64*
U.S. Cl. 439—677 **12 Claims**



1. A unitary electrical terminal receptacle constructed to receive a mating terminal and to be secured within a mating terminal housing constructed to receive said receptacle and a bus bar, comprising:
(a) a multi-panel, open-ended generally rectangular receptacle having an interior upper panel being adjacent to a first side panel, a lower panel being adjacent to the first side panel and opposing the interior upper panel, a second side panel being adjacent to the lower panel and opposing the first side panel, and an exterior upper panel being adjacent

to the second side panel and overlapping the interior upper panel;

(b) the lower panel and the interior upper panel each having contact spring members which extend inwardly into the receptacle so as to form a contact area of the receptacle providing means for contacting and restraining the mating terminal;

(c) at least one of said panels having means connected thereto for making electrical connections and with a cut-out located between the contact area and the means for making electrical connections;

(d) a polarizing tab projecting outwardly from at least one of said panels to insure that the contact area of the receptacle is oriented correctly in a receiving cavity located in the mating housing adapted to receive said receptacle and defining a visible polarizing slot adapted to receive the polarizing tab;

(e) a resilient locking tab extending outwardly at an angle away from at least one of said panels, whereby the resilient locking tab may engage a wall defining a complementary recessed channel of said housing; and

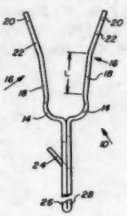
(f) a bus bar shaped to provide an electrical current path to said receptacles located in preselected cavities and a power lead terminal connected to the bus bar.

4,798,546

BIFURCATED FUSE CLIP

William G. Herbert, Ellisville, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 3, 1987, Ser. No. 127,980
Int. Cl.[4] H01H *85/16*
U.S. Cl. 439—830 **26 Claims**



1. A fuse holder for a fuse of the type having two generally flat, parallel, spaced-apart, oppositely disposed, electrical contacts, comprising:

(a) an insulated block having a fuse accepting aperture defined by two generally vertical walls and a bottom wall disposed between said two vertical walls, said bottom wall having a fuse clip accepting aperture therein; and

(b) a fuse clip which is formed from a single strip of electrically conducting material and which is carried by said fuse clip accepting aperture in said insulated block, said fuse clip having:

(i) an elongated base member which fits within said fuse clip accepting aperture in said bottom wall and which has two opposite ends;

(ii) a pair of spaced apart base arms joined to one end of said base member, said base arms being adapted to fit within said fuse accepting aperture adjacent said bottom wall, each base arm extending upwardly and outwardly from said one end of said base member; and

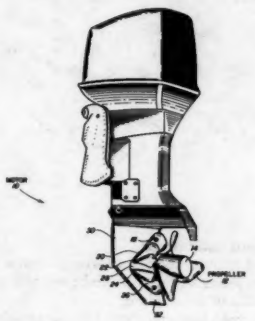
(iii) a pair of springingly loaded generally elongated fuse accepting contacts, each contact having one end joined to one of said base arms and having the opposite end flaring upwardly and outwardly toward the top of said vertical walls when said fuse clip is inserted in said insulated block, said fuse accepting contacts having a flat fuse contacting section which is located adjacent said base arms and which is generally equal in length to the flat electrical contacts of the fuse, and having a fuse accepting section which has one end joined at an angle to said fuse contacting section and which has an opposite end which is adapted to be disposed adjacent the top of said vertical walls when said fuse clip is inserted in said insulated block, the length of said fuse accepting section and said angle being such that when said fuse clip is inserted into said block, said fuse contacting sections are disposed generally parallel to each other.

4,798,547

FUEL EFFICIENT PROPULSOR FOR OUTBOARD MOTORS

Walter S. Gearhart, State College, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1987, Ser. No. 68,995
Int. Cl.[4] B63H *5/16*
U.S. Cl. 440—66 **2 Claims**



1. A fuel efficient propulsor for a motorboat moving in a fluid, comprising:

an outboard motor including a horizontal shaft having a propeller mounted thereon; and

a vane assembly mounted forward of said propeller, said assembly comprising a plurality of stationary vanes applied to only one half of the fluid inflow to the propeller covering the inflow to the left hand side of the propeller looking forward, to produce a swirl in the fluid counter to the swirl generated at said propeller.

4,798,548

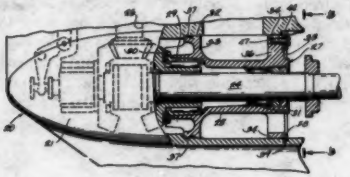
PROPELLER SHAFT BEARING HOUSING RETENTION SYSTEM

Jeffrey P. Higby, Waukegan; Kennedy K. McElroy, Lindenhurst, both of Ill., and Philip A. Zorc, St. Joseph, Mich., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 11, 1988, Ser. No. 142,006
Int. Cl.[4] B63H *21/28*
U.S. Cl. 440—78 **18 Claims**

1. A marine propulsion device comprising an internal combustion engine and a lower unit including a rotatably mounted propeller shaft drivingly connected to said internal combustion engine and a propeller mounted on said propeller shaft, said lower unit further including a gearcase housing having an interior groove and a locating shoulder, a propeller shaft bearing housing within said gearcase housing engaging said locat-

ing shoulder, and a beveled retaining ring received in said interior groove and engaging said propeller shaft bearing housing to bias said propeller shaft bearing housing against said locating shoulder.



4,798,549

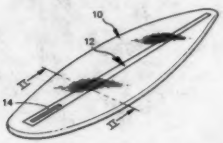
SURFBOARD AND METHOD OF MAKING SAME

Mark D. Hirsch, 1233 Oak Avenue, Carlsbad, Calif. 92008

Filed Jun. 8, 1987, Ser. No. 59,326

Int. Cl.[4] B63H *9/06*

U.S. Cl. 441—74 **20 Claims**



1. A surfboard comprising:

an elongated stringer having a forward end, a rear end, and upper and lower surfaces curved generally to the longitudinal profile of a surfboard;

a passage formed into and extending along substantially the length of said stringer;

outlet ports spaced along said stringer and communicating with said passage;

a fin box formed in said stringer at the rear end thereof and communicating with said passage;

said passage, said ports, and said fin box being constructed and arranged for the introduction of at least one of foam and steam therethrough for introduction into a space adjacent said stringer; and

a three dimensional body formed around said stringer and having top and bottom outer surfaces defining a surfboard configuration.

4,798,550

FLOATING DEVICE FOR SUPPORTING A SWIMMER FLOATING ON THE WATER EVEN IN RESTING POSITION

Cesare Biancucci, Via Verdi, 4, 63022 Falerone (AP), Italy

Filed Oct. 15, 1986, Ser. No. 918,969

Int. Cl.[4] A63B *31/00*

U.S. Cl. 441—129 **4 Claims**

1. A floating device for supporting a swimmer on the water surface and in a resting position, comprising,

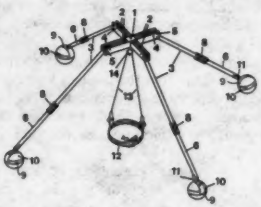
an upper cross with four arms which each have two parallel rigid plates;

four tubular elements each being hinged between the two rigid plates forming one of said arms;

four lock elements inserted in said arms so as to keep said tubular elements in positions where they together define a truncated-pyramidal form when the device is in use, said lock elements being removable for collapse of the device to allow the upward folding of said tubular elements;

four telescopic elements which are telescoped on said tubular elements for transport and storing and are extendible for use of said device, a transverse pin for locking each telescopic element to its respective tubular element;

four float means for floating on the water surface, said float means being mounted in containing structures which are connected to the lower ends of said telescopic elements,



a jacket or belt that is worn by the swimmer, a suspension pin placed in the center of said cross, and suspension means for suspending the jacket or belt from the suspension pin, said suspension means being at a level which keeps the jacket or belt worn by the swimmer at the level of the float means which are floating on the water surface.

4,798,551

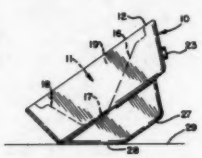
FLOATABLE BABY CARRIER

Gary W. Dumonceaux, R.R. #2, Box 57, Rochester, Ill. 62563; Edwin R. Weber, R.R. #1, Box 311, Pawnee, Ill. 62558, and James D. Gibbs, 222 John St., Farmer City, Ill. 61842

Filed Oct. 19, 1987, Ser. No. 109,323

Int. Cl.[4] B63C *9/08*

U.S. Cl. 441—130 **8 Claims**



1. A floatable carrier for supporting a baby upright either in a body of water or on a generally flat support surface, comprising interior walls forming a baby receiving cavity, exterior walls fastened to said interior walls and forming a buoyancy space therebetween, a non-fluid buoyant material in said space, said interior walls including a bottom wall, belts secured to at least one of said walls for retaining a baby in said cavity, and a ballast made of solid material secured to and extending downwardly from said bottom wall.

4,798,552

APPARATUS FOR PRODUCING PICTURE TUBE

Koichi Yasuda, Yotsukaido, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 17,535

Claims priority, application Japan, Mar. 19, 1986, 61-59156; Mar. 19, 1986, 61-59159; Mar. 20, 1986, 61-60535; Mar. 20, 1986, 61-60537

Int. Cl.[4] H01J *9/18, 9/42*

U.S. Cl. 445—64 **4 Claims**

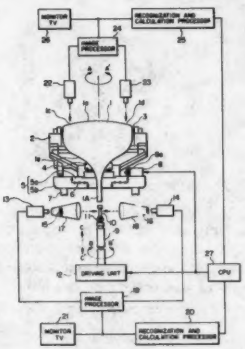
1. An apparatus for producing a picture tube comprising:

bulb holding means for rotatably holding in a circumferential direction a glass bulb having at least a phosphor screen

on the inner surface thereof and a shadow mask fitted therein;

first detection means for detecting the horizontal axis of said phosphor screen inside said glass bulb;

a mount pin to which an electron gun mounted to a stem on the same axis as said glass bulb is mounted in such a manner as to be driven both vertically and circumferentially;



second detection means for detecting an in-line horizontal axis of the aperture center of said electron gun;

calculation means for outputting a "same" signal or "not same" signal by calculating the detection signal by said first detection means and the detection signal by said second detection means; and

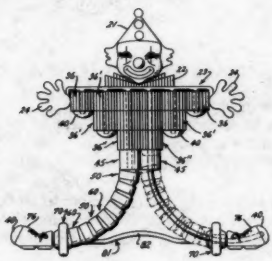
a sealing machine for sealing a glass bulb neck portion to said stem in accordance with said "same" signal.

4,798,553

ANIMATED TOYS

David G. Gentles, 1115 Ringwood Ave., Haskell, N.J. 07420, and Mary A. Gentles, 68 Day St., Bloomfield, N.J. 07003

Filed Oct. 7, 1987, Ser. No. 105,736
Int. Cl.[4] A63H *3/16, 17/25*
U.S. Cl. 446—99 19 Claims



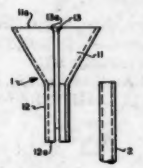
11. A toy apparatus of comprising a skeletal frame, said skeletal frame having an elongated generally curvilinear central portion having a head means formed at one end thereof and a tail means formed at the other end thereof, at least two of said spaced shaft means extending generally perpendicularly outwardly from said central portion of said skeletal frame so as to be generally perpendicular with respect thereto, at least one flexible gear means mounted to each of said outwardly extending shaft means, means for securing each of said gear means in rotational relationship with respect to said shaft means, each of said gear means having outermost lands and grooves defining intermeshing surfaces for meshing with an adjacent one of said gear means whereby motion or rotation of one of said gear means will cause rotation and motion with respect to the other of said gear means.

4,798,554

BALLOON HOLDER

David C. Nelson, 1585 S. Cleveland-Massillon Rd.; Michael J. Fresh, 3448 Copley Rd., both of Copley, Ohio 44321, and Herbert Mueller, Herzaach, Switzerland

Continuation of Ser. No. 023,546, Mar. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 838,516, Mar. 11, 1986, Pat. No. 4,715,841. This application Apr. 19, 1988, Ser. No. 185,291
Int. Cl.[4] A63H *3/06*
U.S. Cl. 446—222 7 Claims



1. A funnel-shaped, one piece balloon holder, open at both ends and comprising:

(a) an open cup comprising a base, an outer edge, and a sloping sidewall which slopes inwardly from said outer edge to said base,

(b) a hollow cylindrical stem extending longitudinally from the base of said cup on the outside thereof,

(c) a longitudinal slit for insertion of the neck of a balloon into said balloon holder, said slit extending the entire length of said balloon holder form the outer edge of the cup to the outer end of said stem; and

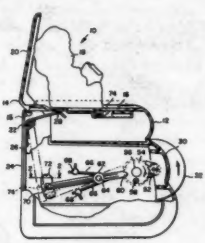
(d) a short slot at one end of said balloon holder for engaging said neck and thereby securing said balloon to said cup.

4,798,555

TOY POP-UP FIGURE

Bernhard Schaub, East Aurora, N.Y., and Steven Taylor, Minnetonka, Minn., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 17, 1986, Ser. No. 920,691
Int. Cl.[4] A63H *13/16, 5/00*
U.S. Cl. 446—310 17 Claims



1. A pop-up figure toy comprising:

a body having a first surface with an opening therethrough;

cylindrical means rotatably supported by the body on an axis parallel to said surface of said body;

said cylindrical means having a surface portion extending through said opening;

cover means movably mounted on the body, the cover means supporting a figure and movable between a normal closed position in which the figure is hidden within the body, and a pop-up position in which the figure is displayed;

resilient means for biasing the cover means to its pop-up position;

means for latching the cover means in its closed position; and

means coupling the cylindrical means to the cover means, whereby rotation of the cylindrical means will intermittently release the latching means causing the cover means and figure to be rapidly moved by the resilient means to its pop-up position.

4,798,556

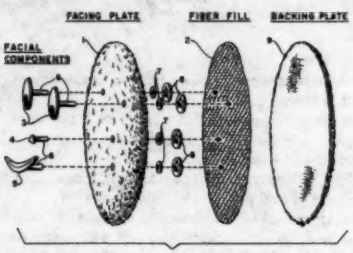
ARTICLE HAVING A CHANGEABLE-EXPRESSION FACE

Paul D. Vicars, Fairborn, Ohio; Roy J. Hendricks, Fairfax, Va., and Eugene F. Goubeaux, Jr., Dayton, Ohio, assignors to U.S. Creative Concepts, Fairborn, Ohio

Filed Jul. 30, 1986, Ser. No. 891,787

Int. Cl.[4] A63H *3/36, 3/38*

U.S. Cl. 446—391 **14 Claims**



1. An article having a changeable-expression face, said article comprising:

a facing plate having a front side and a back side;

three facial components each independent moveable, one component having a feature part with the appearance of a mouth, shaped to convey at least one mood disposition in one direction of movement for positioning thereof and also further mood dispositions in other direction of movement for positioning thereof, and two having a feature part with the appearance of an eye, that is offset from center positioning thereof, said facial components being non-detachably rotatably mounted on said facing plate, with said facial components each having a feature part disposed on said front side of said facing plate, and a securing part that extends through said facing plate to said back side thereof, and whereby rotation of said facial components changes the expression of said article;

fastening means disposed on said securing parts of said facial components, remote from said front side of said facing plate, for providing non-detachable rotatable mounting of said facial components on said facing plate; and

a backing plate secured to said facing plate in such a way as to cover said back side of the latter, said securing parts of said facial components, and said fastening means.

4,798,557

CAMISOLE UNDERWIRE BRA GARMENT

Lucretia M. Scott, 12633 Burbank Blvd., #208, North Hollywood, Calif. 19607

Filed Sep. 22, 1987, Ser. No. 99,855

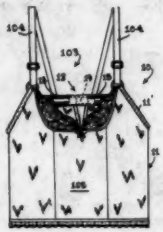
Int. Cl.[4] A41C *3/08*

U.S. Cl. 450—31 **5 Claims**

1. A camisole underwire bra garment comprising:

a camisole unit having a generally scooped neck and a plurality of camisole strap elements; and

an underwire bra unit including a pair of underwire bra cups operatively attached to one another wherein the bra cups are provided with at least one bra strap member for encircling the underwire bra unit around a woman's chest, and wherein the upper portion of the underwire bra unit is



only operatively attached to the upper portion of the camisole unit along the edges of their common upper portions whereby the camisole unit is suspended from the upper portion of said underwire bra unit.

4,798,558

COIN DISPENSING APPARATUS WITH EJECTING MEMBER

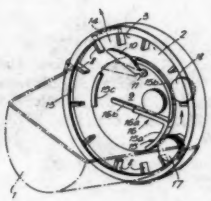
Robert D. Bellis, Lancashire, England, assignor to Coin Controls Limited, Lancashire, England

Filed Jun. 24, 1987, Ser. No. 65,927

Claims priority, application United Kingdom, Oct. 24, 1986, 86-25531

Int. Cl.[4] G07D *1/00*

U.S. Cl. 453—32 **17 Claims**



1. A coin dispensing apparatus comprising:

a coin source;

a rotary member;

a plurality of projections disposed around the rotary member to define receptacles;

means for feeding coins from the coin source into the receptacles;

means for rotating the rotary member to move coins in the receptacles along an annular coin path;

a coin outlet disposed radially to one side of the annular coin path;

a movable ejector member positioned on the side of said coin path opposite said one side; and

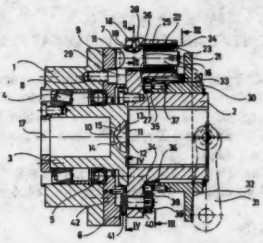
means for biasing said ejector member radially of the coin path toward said coin outlet, said ejector member being spaced from said coin outlet such that said ejector member is moved against the action of said biasing means by a coin in a receptacle as the coin approaches the outlet, the biasing means being operative when the coin reaches the outlet to cause the ejector member to eject the coin radially of the coin path and through the outlet;

said projections and ejector member being so arranged and dimensioned that each projection passes unimpeded between the ejector member and the outlet upon rotation of the rotary member.

4,798,559
AUTOMATIC OVERLOAD CLUTCH STRUCTURE

Ruprecht Maurer, and Karlheinz Tintner, both of Bad Homburg, Fed. Rep. of Germany, assignors to Ringspann Albrecht Maurer KG, Bad Homburg, Fed. Rep. of Germany

Filed Jan. 20, 1987, Ser. No. 5,483
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602282
Int. Cl.[4] F16D 7/04
U.S. Cl. 464—38 23 Claims



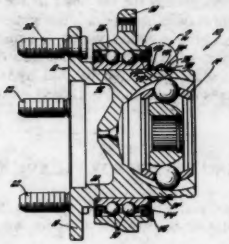
1. Compact overload disconnect clutch having
a pair of clutch parts (1, 2; 44, 54, 55, 73, 74),
one clutch part being adapted to be coupled to a driving shaft providing driving torque and another clutch part being adapted to be connected to a coaxial driven shaft subject to a loading torque, said clutch parts being formed with facing surfaces (6, 7) including means defining tooth elements (11) associated with one clutch part (2) and means defining tooth receiving tooth gap elements (10) on the other clutch part,
said tooth and tooth gap elements having matching interengaging flat flanks (12, 13, 14, 15) defining flank surfaces which extend radially and at an inclination with respect to the axis (17, 60) of the clutch to define generally V-shaped flank surfaces,
wherein
the clutch parts (1, 2; 44, 54, 55, 73, 74) are positioned to be axially immovable with respect to each other;
at least one of said elements comprises movable bolt elements (16, 61) positioned parallel to the axis of rotation (17, 60) of the clutch and being axially shiftably located on one (2) of said clutch parts, said bolt elements being formed with one of said tooth and tooth gap elements (10, 11) at a side proximate to the facing surface of the other (1) clutch part;
force biasing means (22)are provided acting on the bolt elements (16, 61) located on said one (2) of said clutch parts and urging said bolt elements in a direction towards the other clutch part (1); and
wherein at least one (2) clutch part and said at least one of said tooth and tooth gap elements includes
means for positioning said at least one of said tooth and tooth gap elements in said one (2) of said clutch parts for limited longitudinal sliding movement therein and for controlled limited rotation about the longitudinal bolt axis by a limited angle, which limited angle extends up to slightly above a relative angle of rotation of said clutch parts with respect to each other upon disengagement of the tooth element from the tooth gap element.

4,798,560
UNITIZED WHEEL BEARING ASSEMBLY

Robert C. Farrell, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 19, 1985, Ser. No. 702,919
Int. Cl.[4] F16C 33/00; F16D 3/23
U.S. Cl. 464—178 2 Claims

1. A wheel bearing assembly for a motor vehicle comprising;
a wheel hub which has wheel mounting means and an annular shoulder at one end and a tubular part at the other end, which forms an outer drive member of a constant velocity universal joint by which drive is transmitted to the wheel hub,
a bearing assembly having an outer ring which has means for securing the outer ring to a vehicle support and an inner ring which is mounted on the wheel hub against the annular shoulder; and
means for retaining the inner ring on the wheel hub, said means comprising;
a retaining ring having an inner margin disposed in an annular groove in the tubular part of the wheel hub and,
a load ring encircling the wheel hub between the retaining ring and the inner ring of the bearing assembly,

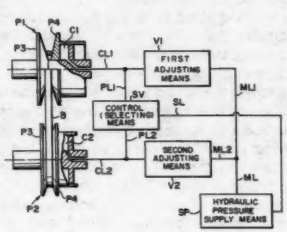


said load ring having a band of concavo-convex cross section which is plastically deformed radially inwardly so that the inner ring is biased against the annular shoulder under a substantial axial preload provided by the load ring,
said load ring having a flange at the end of the load ring which is adjacent the inner ring of the bearing assembly to increase the radial stiffness so that said end at least maintains diameter when the concavo-convex band of the load ring is plastically deformed radially inwardly,
the concavo-convex cross section of the band being V-shaped and the flange at the end of the load ring having a circular rim at its outer end which extends toward the other end of the load ring.

4,798,561
HYDRAULIC CONTROL APPARATUS FOR STEPLESS TRANSMISSION

Katsuhiko Hattori, Nagoya; Hideyuki Suzuki, and Takeo Ogasawara, both of Aichi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Nov. 24, 1986, Ser. No. 933,783
Claims priority, application Japan, Nov. 29, 1985, 60-269090
Int. Cl.[4] F16H 11/02
U.S. Cl. 474—28 21 Claims



1. A hydraulic control apparatus for a stepless transmission wherein endless belt means is stretched or pushed between and wrapped around a pair of pulleys, and the wrapping radius defined in each pulley for wrapping said endless belt means is carried to effect a change of rotational speed between said pulleys by the hydraulic pressure, comprising:
(a) hydraulic pressure supply means comprising pressure

control means for automatically controlling the level of hydraulic pressure supplied therefrom;

(b) first adjusting means for adjusting the hydraulic pressure supplied form said hydraulic pressure supply means to a required level and supplying adjusted hydraulic pressure to a cylinder chamber of either one of said pair of pulleys through a first control circuit;

(c) second adjusting means for adjusting the hydraulic pressure supplied from said hydraulic pressure supply means to a required level and supplying adjusted hydraulic pressure to a cylinder chamber of either one of said pair of pulleys through a second control circuit; and

(d) control means for detecting the hydraulic pressure through said first and second control circuits and for controlling said pressure control means of said hydraulic pressure supply means on the basis of the higher of the output pressures of either said adjusting means in order to supply a hydraulic pressure which is equal to or higher than said higher adjusted hydraulic pressure, whereby the hydraulic pressure generated by said hydraulic pressure supply means is minimized to reduce the power consumption.

4,798,562

TENSIONING DEVICE FOR FLEXIBLE DRIVE ELEMENT

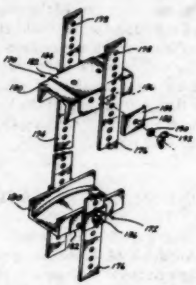
Les Matson, Selah, and Richard Sela, Yakima, both of Wash., assignors to Moxee Innovations Corporation, Moxee City, Wash.

Continuation-in-part of Ser. No. 821,295, Jan. 22, 1986, Pat. No. 4,662,862. This application Jan. 20, 1987, Ser. No. 2,336

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[4] F16H 7/08

U.S. Cl. 474—101 **5 Claims**



1. A tensioning device for a drive system having a flexible, endless chain drive element, the tensioning device comprising:

a first tensioning member having a first contact surface for contacting the drive element;

a second tensioning member having a second contact surface for contacting the drive element, wherein the first and second contact surfaces are stationary with respect to the respective tensioning members; and

positioning means for securing the first and second tensioning members to one another, the positioning means comprising at least one connecting member extending between the first and second tensioning members, the connecting member securing the tensioning members in spaced relationship to one another with the first and second contact surfaces facing one another and spaced apart by a distance sufficient to permit first and second runs of the drive element to pass between the tensioning members in contact with the first and second contact surfaces, respectively, the connecting member including a plurality of openings, and at least one tensioning member including a projection adapted to pass through one of said openings in the connecting member for connecting the tensioning member to the connecting member to thereby permit adjustment of the spacing between the contact surfaces by permitting at least one tensioning member to be secured to the connecting member at a plurality of positions,

whereby the positioning means holds the tensioning members a fixed distance from one another during operation of the drive system, such that when the tensioning device is in contact only with the drive element, the tensioning device can respond to fluctuations in load on the drive element by moving in a direction parallel to the drive element at the points of contact between the drive element and the tensioning members.

4,798,563

SELF-CONTAINED TYPE AUTOMATIC BELT TENSIONER

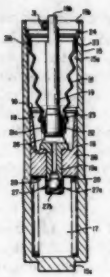
Yoshio Okabe, Chiryu; Yukimori Kobayashi, Gamagori; Makoto Ishikawa, Mishima; Tamotsu Kamiya, Susono, and Tomiaki Atsumi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 8, 1987, Ser. No. 130,180

Claims priority, application Japan, Dec. 8, 1986, 61-290457

Int. Cl.[4] F16H 7/08

U.S. Cl. 474—110 **7 Claims**



1. A self-contained type automatic belt tensioner for automobiles comprising:

a body having an axially extending blind bore therein with an opening at one end, a closed wall at the other end;

a plunger slidably mounted in said blind bore of said body;

a reservoir chamber located in said plunger;

a pressure chamber disposed between said plunger and said closed wall of said body;

a rod member fixed at one end thereof to said plunger and protruding at the other end thereof from said opening of said body;

a bellows shaped elastic diaphragm located in said reservoir chamber with one end thereof being fixed to said rod member and the other end being fixed to said body;

a fluid passage connecting said reservoir chamber and said pressure chamber with each other;

a check valve disposed in said fluid passage so as to allow a fluid flow only from said reservoir chamber to said pressure chamber; and

a return spring interposed between said plunger and said closed wall of said body so as to bias said plunger in the direction of said opening of said body.

4,798,564

DOUBLE BELT TENSIONER

Robert B. Benedict, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 8, 1987, Ser. No. 95,007

Int. Cl.[4] F16H 7/12

U.S. Cl. 474—134 **2 Claims**

1. In a vehicle in which first and second belts driven from the vehicle engine are used to power accessories mounted at varied locations to the vehicle, so that the belts wind through

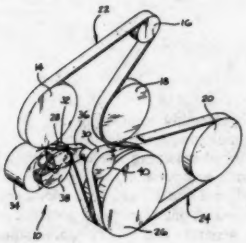
differing paths with differing lengths, and are therefore subject to differing amounts of stretch, a single belt tensioner to continuously maintain the proper tension in each belt, said tensioner comprising,

a primary arm pivoted at one end of said vehicle,

a single resilient means operable between said vehicle and said primary arm to continually forcibly swing said arm about said one end in one direction,

a secondary arm freely pivoted intermediate its two ends to the other end of said primary arm,

a first idler pulley on said secondary arm engageable with the outside of a run of said first belt, and,



a second idler pulley on said secondary arm engageable with the inside of a run of said second belt,

whereby said single resilient means will push said first idler pulley into said first belt run while simultaneously pulling said second idler pulley into said second belt run, thereby tensioning each of said belts simultaneously, with any differential in the stretching of said two belts being compensated for automatically by the secondary arm pivoting relative to the primary arm in either direction so that either pulley may move up or down from its original position as said primary arm swings.

4,798,565

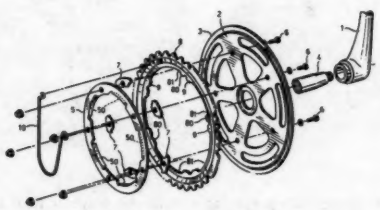
CHAIN WHEEL ASSEMBLY

Winnett Boyd, 107 Victoria Place, R.R. No. 1, Bobcaygeon, Ontario, Canada K0M 1A0

Filed Jul. 9, 1987, Ser. No. 72,026

Int. Cl.[4] G05G *1/14*

U.S. Cl. 474—158 **6 Claims**



1. A lost motion chain wheel assembly for a pedal operated vehicle comprising a chain wheel centre for fixed mounting to a pedal crank, an externally toothed annular chain wheel rim retained concentrically on the chain wheel centre for limited rotation relative thereto, and bias spring means acting between the chain wheel centre and the chain wheel rim to bias the rim forwardly relative to the centre in relation to the intended direction of forward rotation of the chain wheel, the chain wheel rim defining on its inner periphery a plurality of peripherally spaced concave recesses, and the chain wheel centre having a journal supporting the inner periphery of the chain wheel rim on a circumference much nearer to the outer periphery of the rim than to an actual centre of rotation of the assembly, as well as a plurality of peripherally spaced convex projections entering the recesses, the projections being of lesser peripheral extent than the recesses whereby to provide for said limited relative rotation.

4,798,566

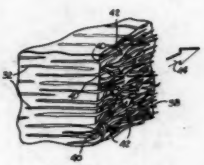
POWER TRANSMISSION BELT

Douglas R. Sedlacek, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Nov. 19, 1987, Ser. No. 122,989

Int. Cl.[4] F16G *5/08*

U.S. Cl. 474—238 **18 Claims**



1. In a power transmission belt of the raw edge type with oppositely facing friction driving surfaces and having discontinuous fibers dispersed in and oriented transversely of an elastomeric body portion wherein improvements in the driving surfaces comprises:

portions of fiber protruding from the body at the driving surfaces, the fiber portions bent against the body in such a manner as to expose lateral side portions of fiber which define part of the friction driving surface.

4,798,567

POWER TRANSMISSION BELT

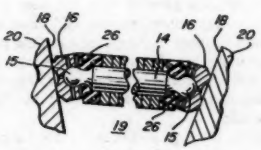
Takeshi Hoshiro, Hyogo; Mu Matsuo, Shizuoka, and Hiroshi Takano, Hyogo, all of Japan, assignors to Mitsuboshi Belting, Limited, Japan

Filed Mar. 3, 1988, Ser. No. 163,657

Claims priority, application Japan, Mar. 4, 1987, 62-50961; Jun. 15, 1987, 62-149781

Int. Cl.[4] F16G *1/22, 5/18*

U.S. Cl. 474—242 **27 Claims**



1. A chain-type power transmission V-belt for use with a pulley having a groove defining converging opposite sidewalls, said V-belt comprising:

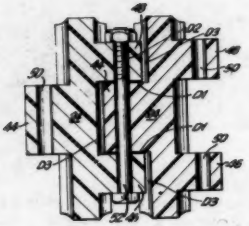
a plurality of links each having opposite ends provided with a through opening;

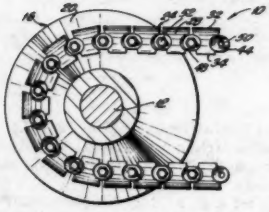
a plurality of pins for retaining said links in side-by-side relationship to define a longitudinally continuous flexible chain arrangement having a flatwise extent, said pins extending through aligned ones of said through openings and defining opposite ends;

a plurality of side elements each defining an outer surface and an inner surface, said side elements having means associated therewith for freely adjustably mounting the side elements one each on said opposite ends of said plurality of pins, with said outer surfaces disposed outermost laterally of the chain arrangement for engaging the sidewalls of a pulley groove; and

positioning means for causing the side elements to have said outer surfaces adjustably disposed at an angle to said flatwise extent of said chain arrangement corresponding to the angle of said sidewalls of the pulley being engaged by the outer surface of the side elements.

4,798,568
LINK BELT DRIVE
Joery McSwain, Rte. 4, Box 475, Albemarle, N.C. 28001
Filed Jul. 23, 1987, Ser. No. 76,778
Int. Cl.[4] F16G *1/24*
U.S. Cl. 474—242 22 Claims





1. A drive belt comprising:

a plurality of interconnected links, each of said links having a main portion, first and second drive surfaces on opposite ends of said main portion, first and second longitudinal side surfaces extending between said drive surfaces, each of said side surfaces having a longitudinal recess surface,

at least one hinge member on each of said recess surfaces, each of said hinge members having a longitudinal bore,

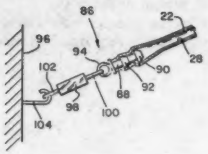
the hinge member of each link extending into the recess of an adjacent link,

a pin extending through said bores of said hinges of adjacent links to provide axial alignment of hinge members of adjacent links,

said axis of said bores being equidistant between said recesses of said adjacent links,

said hinge members of adjacent links being longitudinally spaced from one another to provide a first predetermined gap.

4,798,569
COUPLING KIT
Earl L. Alderfer, 3629 Logan Ave., Ft. Wayne, Ind. 46803
Division of Ser. No. 542,348, Oct. 17, 1983. This application Apr. 28, 1988, Ser. No. 187,509
Int. Cl.[4] F16G *3/07, 11/05*
U.S. Cl. 474—255 2 Claims



1. A coupling assembly comprising:

a line means including a tubular end;

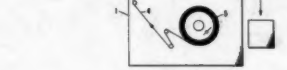
a connector member having an elongate rigid body member with opposite end portions;

a plurality of individual rigid barb members circumferentially disposed on one of said end portions, said barb members being separate and axially spaced apart and having respective maximum outer transverse dimensions greater than the inner diameter of the tubular end, the respective maximum outer transverse dimensions of said barb members decreasing in dimension from the axially outermost one of said barb members to the axially innermost of said barb members to facilitate insertion of said end portion into said tubular end;

said one end portion adapted to be forcibly received in said tubular end and said barb members frictionally engaging the inner surface of said tubular end; and

an attachment means on the other of said end portions and adapted to be securely attached to a support object, whereby said line means is securely coupled to the object.

4,798,570
PROCESS FOR PREPARING FILTER RODS
George Jurkiewitsch, Conyers, Ga., assignor to Hercules Incorporated, Wilmington, Del.
Filed Dec. 9, 1982, Ser. No. 448,138
Int. Cl.[4] A24D *3/02*
U.S. Cl. 493—44 4 Claims



1. A method for preparing a synthetic polymer fiber filter rod from uncrimped tow of low bulk denier which comprises

passing bulked or texturized yarn tow of continuous synthetic filaments having a bulk denier of about 6,000–10,000 through a fluid bulking or texturizing jet under temperature and pressure conditions sufficient to obtain bulked yarn having a bulk index increase of about 25–75%; and

guiding and feeding the resulting bulked yarn directly from the egress of the said fluid bulking or texturizing jet into the garniture of a downstream-positioned filter rod-making apparatus, the velocity ratio of said bulked yarn at the egress of said fluid texturizing jet-to-velocity at filter rod take-off of the filter rod-making apparatus being about 15:1 to 25:1, whereby overfed bulked yarn is continuously

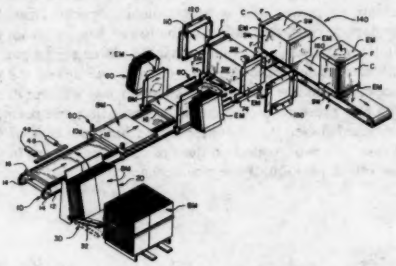
randomly compacted within the garniture of said filter rod-making apparatus prior to wrapping and cutting.

4,798,571

CONTAINER FORMING APPARATUS AND METHOD

Wayne F. Everman, Cedar Falls; Randy J. Klug, Dike, and Raymond L. Russell, Cedar Falls, all of Iowa, assignors to Container Corporation of America, Clayton, Mo.

Filed Oct. 19, 1987, Ser. No. 109,998
Int. Cl.[4] F16H 7/14
U.S. Cl. 493—114 15 Claims



1. Apparatus for automatically forming a three-piece bulk shipping container from a pair of top and bottom end members, each having an end wall with flanges foldably joined to side edges thereof, and a collapsed tubular body member, having a plurality of side walls, said apparatus comprising:

(a) conveyor means, for moving said members between operating stations, including a horizontally extending conveyor;

(b) a body member feeding station including body member feeding means disposed adjacent one side of said conveyor for storing said body members in collapsed condition and for placing them, one at a time, horizontally across said conveyor;

(c) an end member feeding station including end member feeding means disposed at opposite sides of said conveyor for storing said top and bottom end members, and for positioning them vertically in channels at opposite sides of said conveyor;

(d) an adhesive applying station located between said body member and end member feeding stations and including means for applying adhesive to end areas of said body members;

(e) a container forming station including:

(i) body member erecting means for converting said body members from flat collapsed to tubular erected condition;

(ii) container assembly means for pushing both of said end members snugly against opposite ends of said body member at the same time and for folding said flanges against the side walls thereof.

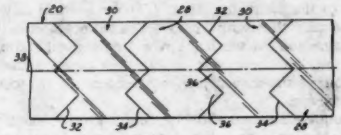
4,798,572

COLLAPSIBLE BAG AND METHOD

Arthur E. LaFleur; Arnie LaFleur, and Lee LaFleur, all of Manistee, Mich., assignors to Custom Packaging Systems, Inc., Manistee, Mich.

Division of Ser. No. 58,924, Jun. 5, 1987. This application Feb. 17, 1988, Ser. No. 157,211
Int. Cl.[4] B31B 33/64, 33/68, 37/16
U.S. Cl. 493—195 24 Claims

1. A method of making a plurality of collapsible bags which when expanded have a pair of spaced apart generally square ends interconnected by four generally rectangular side walls comprising; forming from an elongate web of a flexible material a plurality of substantially identical tubular blanks, each blank having a circumferentially continuous central portion and four substantially identical isosceles triangular portions adjacent each end thereof and each of which is integral with the central portion and without producing any substantial amount of waste material of the web between adjacent ends of adjacent blanks by severing the web along a zig zag line having substantially straight segments defining the sides of the isosceles triangular portions with said sides of each triangular portion being substantially at a right angle to each other, on each end of each tubular blank connecting together adjacent sides of adjacent triangular portions along connection lines extending from the central portion toward the apexes of the associated



triangular portions at least one third of the length of such adjacent sides to provide when the bag is filled substantially square ends of the bag, and in at least one square end terminating each such line of connection short of the apexes of its associated triangular portions so as to form an opening through such one square end adjacent the center thereof, whereby when each bag is filled with material it has a pair of generally square ends interconnected by generally transversely extending side walls and when empty can be collapsed into a configuration having a pair of generally flat overlying panels with a generally hexagonal shape and a pair of folded gusset panels extending inwardly between the flat panels.

4,798,573

MACHINE FOR THE MANUFACTURE AND STACKING OF BAGS, POUCHES AND THE LIKE MADE FROM A THERMOPLASTIC MATERIAL

Georges Lagain, Eaghien-les-Bains, France, assignor to FMC Corporation, Chicago, Ill.

Filed Apr. 16, 1987, Ser. No. 39,055
Claims priority, application France, Apr. 18, 1986, 8605657
Int. Cl.[4] B31B 1/64
U.S. Cl. 493—204 10 Claims

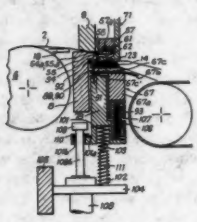
1. A machine for the manufacture and stacking of bags, pouches and the like made from a flattened sheath of thermoplastic material, the machine of the type generally comprising upper and lower sheath transporting roller means intermittently driven for intermittently advancing the sheath between upper and lower welding jaw means intermittently opening and closing in timed relation to the intermittently advancing sheath for advancing the sheath having a welded closed end by a bag length to a stacking table in the jaw open position and for welding the advanced welded closed end sheath deposited on the stacking table in the jaw closed position for the start of a second welded closed end, clamping means for clamping the deposited welded closed end sheath to the stacking table and for flexing and tensioning a segment of the clamped sheath extending from the closed jaws to the clamping means prior to cutting by an intermittently driven knife means mounted on an endless timing belt, the knife means activated in timed relation to the closing of the jaws and the clamping of the sheath to the stacking tablee and when activated the knife means passing crosswise through the segment for cutting and forming an open ended bag with the welded closed end supported on the stacking table, pin means for impaling the cut segment of the formed bag thereon and for forming a uniform stack of bags on the stacking table, means for unpinning the stack of bags after a predetermined number of bags have been pinned and uniformly stacked on the stacking table, and conveyor means for removing the unpinned uniform stack of bags from the stack-

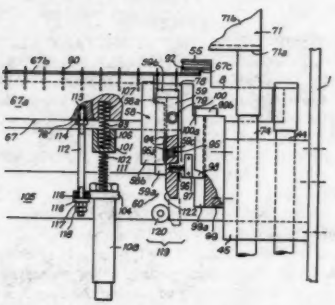
ing table for the start of a new stack of pinned bags, wherein the improvement comprises:

a braking means (5) upstream of the upper and lower roller means (7,6) for intermittently halting the advancing sheath in timed relation to the roller means intermittently stopping the advancement of the sheath to the upper and lower jaws (9,8) concurrent with the jaws closing on the sheath and forming the welded closed end of the bag; and wherein,

the lower welding jaw (8) is slidably mounted to the machine (45, 44) for vertical movement from a set low position to a set high position and the upper welding jaw (9) is slidably mounted by a lost motion connection (80, 81, 82, 85) to the clamping means (71) for vertical downward movement therewith from a set raised position to the low position and for vertical upward movement through the lost motion connection to the high position under the action of the lower jaw independent of the clamping means; and,

the clamping means is slidably mounted to the machine (74, 45) for vertical movement from a set raised position above





the level of the upper welding jaw in the open position to a set lowered position below the level of the lower welding jaw in both the low and high positions thereof, and the lower jaw having a shoulder means (53) extending toward the clamping means (71) for holding fast the segment (88) of the sheath to be cut in the closed condition of the jaws in both the low and high positions of the lower jaw, the shoulder means having a resilient transversely extending pin engaging pad (92) mounted to a horizontal projecting underside (54) thereof, and having a transversely extending horizontal groove (55) forming a counter blade for the knife means (56) mounted on the timing belt (61), and the clamping means having a belt guiding means (57) for positioning the knife means for entry into the counter blade groove in the low position of the lower jaw and in the set lowered position of the clamping means and for guiding the knife means in a horizontal path through the counter blade groove and cutting the segment of the sheath; and wherein,

the pin means (90) is mounted to a carrier (78) slidably mounted to the machine (98, 99, 45) for vertical movement from a set raised position where the pin means pass through holes (91) in the stacking table (67b) and engage with the resilient pad mounted to the underside of the shoulder of the lower jaw means to a set lowered position where the pin means is below the stacking table, and the stacking table is resiliently connected by biasing means (93) to the pin carrier and is slidably connected to the pin carrier by a ratchet and pawl means (60) for incrementally lowering the stacking table independently of the pin carrier by the action of the clamping means clamping the successive sheaths deposited on a resilient transversely extending sheath receiving pad (67c) mounted to the top of the stacking table which is vertically aligned with the clamping means and is longitudinally spaced from the underside of the shoulder on the lower jaw and from the holes in the stacking table so that the pin engaging pad on the underside of the shoulder rests on the tips of the pin means in the low position of the lower jaw without exerting any pressure thereon and the immediate cut segment unflexed under the shoulder in the high position of the lower jaw is deposited on the tips of the pin means in the set raised position of the pin means.

4,798,574

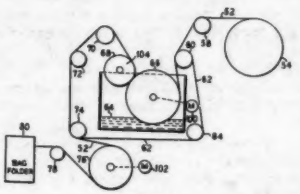
METHOD OF MAKING A BAG WITH A BARRIER MATERIAL

Ronald Marsik, Willow Springs, Ill., assignor to Bagcraft Corporation of America, Chicago, Ill.

Filed Dec. 9, 1987, Ser. No. 130,618

Int. Cl.[4] B31B *1/74, 29/16*; B05D *1/32*

U.S. Cl. 493—267 **12 Claims**



1. A method of coating paper for use in making paper bags with a barrier material, comprising the steps of:

(a) continuously removing in a direction of travel a strip of paper from a source of paper at a predetermined speed;

(b) masking with a liquid impervious mask at least one longitudinal portion of said strip of paper in said direction of travel;

(c) routing said strip of paper and said mask through a bath of liquid barrier material, said liquid barrier material substantially saturating said strip of paper except for said masked portion;

(d) removing said mask from said strip of paper after moving out of said bath of liquid barrier material; and

(e) forming a selected length of said strip of paper into the bag.

4,798,575

METHOD AND APPARATUS FOR THE MANUFACTURE OF FILTERS

Per-Erik Siversson, Munkedal, Sweden, assignor to Flodins Filter AB, Lysekil, Sweden

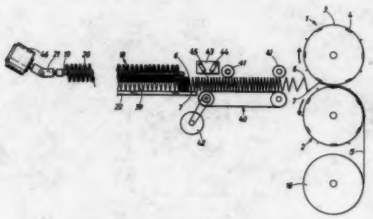
PCT No. PCT/SE86/00300, § 371 Date Feb. 20, 1987, § 102(e) Date Feb. 20, 1987, PCT Pub. No. WO86/07580, PCT Pub. Date Dec. 31, 1986

PCT Filed Jun. 19, 1986, Ser. No. 32,728

Claims priority, application Sweden, Jun. 20, 1985, 8503078

Int. Cl.[4] B05B *1/14*

U.S. Cl. 493—346 3 Claims



1. An apparatus for manufacturing a pleated filter from a continuous band of filter material, said apparatus comprising a folding device for folding a continuous band of filter material into a folded band of filter material with folds having creases across the band and lateral edges lengthwise of the band; a supporting surface for receiving the folded band of filter material so that one side of the folded band is turned towards the supporting surface and the other side of the folded band is turned away from the supporting surface; at least one screw means above the supporting surface and having threads for spacing the creases on the side of the band turned away from the supporting surface at predetermined distances from each other; two conveyor means respectively arranged laterally of the screw means for feeding and for attaching strips to the lateral edges while said screw means threads are engaged to spaced the creases of the band to thereby secure the folds in position at the distances at which they are spaced by the screw means; and means for rotating the at least one screw means and for advancing the two conveyor means in synchronism with each other.

4,798,576

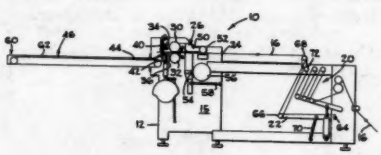
BAG MAKING MACHINE

Rene F. DeBin, Aalst, Belgium, assignor to FMC Corporation, Chicago, Ill.

Filed May 1, 1987, Ser. No. 45,955

Int. Cl.[4] B31B *23/02*

U.S. Cl. 493—196 1 Claim



1. In a bag making machine having an upstream constant web feed section and a downstream intermittent web feed section defined by the path of a web moving therethrough, a combination of a first dancer having dancer arms supporting multiple rolls along the web path downstream of the constant web feed section and a second dancer having at least one roll, wherein the improvement comprises:

the second dancer having a pair of arms each pivotally mounted at one end adjacent the constant web feed section of the bag making machine and each having a swingable end carrying the one roll therebetween and extending a distance greater than the length of the dancer arms of the first dancer in a direction toward the intermittent web feed section of the bag making machine, the one roll positioned below and along the web path downstream of the first dancer having the multiple rolls, means for resiliently urging the swingable ends of the arms downwardly away from the first dancer, and at least one idler roll interposed along the web path between the one roll and the intermittent web feed section for directing the web in a horizontal path to the intermittent web feed section of the bag machine.

4,798,577

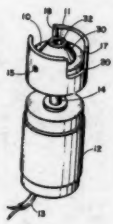
SEPARATOR DEVICE AND METHOD

Allen J. Brenneman, Elkhart; Harvey B. Buck, Jr., Indianapolis; Jerry T. Pugh, and Steven P. Robertson, both of Elkhart, all of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed May 12, 1986, Ser. No. 862,301

Int. Cl.[4] B04B *1/04*

U.S. Cl. 494—67 7 Claims



1. Centrifugal device for use in fractionating and separating finely divided solid particulate material suspended in a liquid having upper and lower portions forming an inner cavity for retaining said liquid, wherein the upper and lower portions are rigid and joined together such that an elongated capillary passageway extends outwardly radially from the inner cavity of the centrifuge device to an outer cavity at the end of the elongated capillary passageway opposite said inner cavity and in which the outer cavity contains a chamber for retaining solid particulate material separated during fractionation, wherein:

said capitally passageway is between 5 and 30 thousandths of an inch in diameter;

said upper portion is sloped at an acute angle greater than about 30° to vertical;

said lower portion has conical portion forming an acute angle of 60° to 120°; and

wherein the elongated capillary passageway contains a barrier at the junction of said passageway and the inner cavity which extends transversely completely across said passageway and prevents particulate material present in the elongated capillary passageway from remixing with liquid in the inner cavity upon the completion of fractionation.

4,798,578

AUTOTRANSFUSION DEVICE

Alan B. Ranford, St. Louis, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

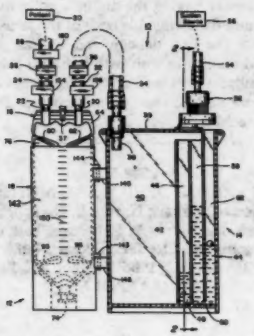
Filed Feb. 13, 1987, Ser. No. 14,508

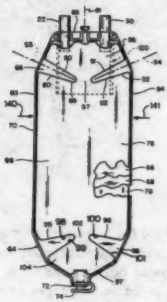
Int. Cl.[4] A61M *1/03*

U.S. Cl. 604—4 18 Claims

1. A body fluid collection device comprising a collapsible bag assembly including a bag having a pair of opposed sidewalls and an inlet in fluid communication with the interior of

said bag for receiving body fluid, and a pair of relatively stiff flexible members respectively connected to said sidewalls, said members having portions between the opposed side edges thereof bendable outwardly in opposite directions from each other to expand said bag in response to the application of a





force tending to move said opposed side edges generally toward each other, each of said members having a pair of slots adjacent each of the opposite ends thereof, each of said slots having spaced opposed sidewalls, each pair slots extending inwarding from the opposed side edges of the member adjacent each of the opposite ends thereof.

4,798,579

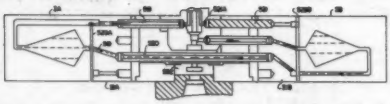
ROTOR FOR CENTRIFUGE

Harry A. Penhasi, Cupertino, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 30, 1987, Ser. No. 115,217

Int. Cl.[4] B04B *5/02, 9/00, 11/00*

U.S. Cl. 494—18 **10 Claims**



1. An improved rotor for a centrifuge that operates by centrifugal elutriation comprising,

a unitary chamber assembly having at least one separation chamber, a rotating fluid seal, and tubes for passing fluid from and to said chamber through said rotating seal,

a generally flat disk assembly with at least one recess, said recess having walls, said separation chamber positioned in said recess, whereby said walls physically hold said chamber assembly, and

a quick release mechanism connecting said chamber assembly and said disk assembly.

4,798,580

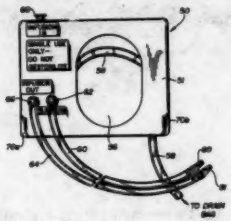
DISPOSABLE PERISTALTIC PUMP CASSETTE SYSTEM

Deborah A. DeMeo, Hatboro; Robert M. Bross, Ivyland, and Kenneth P. Cook, Blue Bell, all of Pa., assignors to Site Microsurgical Systems, Inc., Horsham, Pa.

Filed Apr. 27, 1987, Ser. No. 43,120

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—30 **18 Claims**



1. A microsurgical irrigation/aspiration system, comprising:

roller head means for performing peristaltic pumping and axially extending from the outermost panel of an irrigation/aspiration instrument, including a plurality of rollers located in a plane offset from and parallel to the plane of said outermost panel; and

removable cassette means for retaining a tubing section which cooperates with said roller head means in the performance of peristaltic pumping, including said tubing section, said cassette means having an aperture passing therethrough for engaging said roller head means so that said cassette is located in said plane and the outer dimensions of said cassette completely radially surround said rollers of said roller head means with said tubing section located between said roller head means and an interior wall of said cassette defining said aperture; said cassette further including a selectable occludable infusion line passing therethrough.

4,798,581

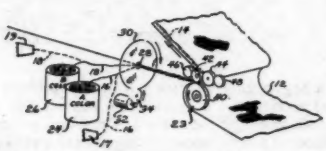
APPARATUS FOR FORMING A VISUALLY DETECTABLE ELEMENT

James L. Jessup, Elk Grove Village, Ill., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 867,000, May 20, 1986, which is a continuation of Ser. No. 379,683, May 19, 1982, abandoned. This application Oct. 26, 1987, Ser. No. 112,343

Int. Cl.[4] A61B *19/00;* **D01H** *7/02;* **B29C** *47/04;* **B29D** *7/00*

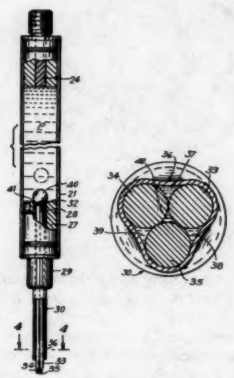
U.S. Cl. 493—338 **2 Claims**



1. An apparatus for forming a surgical sponge comprising an elongated visually detectable element on a sheet of absorbent material, comprising:

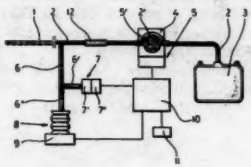
means for forming the entire portion of a pair of different colored strands by extrusion;
means for twisting said strands together into the elongated element;
means for placing the element on said sheet; and
means for bonding the element to the sheet.

4,798,582
NEEDLE CARTRIDGE
Alan Sarath, Teaneck, N.J., and James A. Mawhirt, Brooklyn, N.Y., assignors to Permark Corp. c/o Scl/Med Advances Corp., Teaneck, N.J.
Filed Oct. 27, 1987, Ser. No. 113,947
Int. Cl.[4] B43K 5/00; A61F 2/64
U.S. Cl. 604—47 **6 Claims**



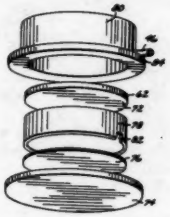
1. A needle cartridge assembly for a surgical operating pen or tatooing instrument, comprising
(a) elongated cylindrical tube means;
(b) an upper end cap means generally closing the top end of said tube means;
(c) adapter means associated with said upper end cap means for mounting said needle cartridge within an operating instrument; said adapter means including an orific for air flow;
(d) a lower plug means closing the bottom end of said tube means and forming a pigment reservoir;
(e) liquid pigment filling said reservoir;
(f) a thin cylindrical discharge tube passing through said lower plug means;
(g) a tri-needle assembly comprising elongated tatooing needles supported in and projecting outwardly from said discharge tube;
(h) a steel ball adapted to be seated in a first mode upon the upper end of said discharge tube to prevent flow of pigment from said reservoir to said needle assemble and adapted to be displaced and moved within said reservoir in a second operating mode;
(i) a portion of said delivery tube proximate to its bottom end being crimped about and into contact with the outer surfaces of said needles thereby retaining said needles in intimate contiguous contact and cooperating therewith to define four discrete passages for pigment flow.

4,798,583
METHOD AND APPARATUS FOR ASPIRATING SECRETED FLUIDS FROM A WOUND
Walter Beck, Obere Hüslhochstr. 87, CH-8700 Küsnacht; Siegfried Berger, Wernau, and Margrit Werner, Philipp-Wasserburg-Str. 30, 6500 Mainz-Gonsenheim, all of Fed. Rep. of Germany, assignors to Walter Beck and Margrit Werner, both of, Fed. Rep. of Germany
Division of Ser. No. 798,844, Nov. 18, 1985, Pat. No. 4,713,052.
This application Jul. 22, 1987, Ser. No. 76,343
Int. Cl.[4] A61M 31/00
U.S. Cl. 604—48 **12 Claims**



1. A method for aspirating secreted fluids from a post-operative wound by means of a controllable negative pressure source to which a drain is connected by means of a tube, a container for collecting the aspirated secreted fluid, a negative pressure measuring device and a regulator which controls the negative pressure source with inputs for the actual value determined by the negative pressure measuring device and for the prescribed set point values of the negative pressure, comprising the step of adjusting the negative pressure effective at the drain according to a selectable pressure/time diagram, wherein the negative pressure effective at the drain is lowered by reducing the volume in which the negative pressure prevails.

4,798,584
SELF-SEALING INJECTION RESERVOIR
John C. Hancock; William R. Dubrul, both of Santa Barbara, and Charles J. Heyler, III, Thousand Oaks, all of Calif., assignors to McGhan Medical Corporation, Santa Barbara, Calif.
Division of Ser. No. 781,865, Sep. 30, 1985, Pat. No. 4,738,657.
This application Mar. 14, 1988, Ser. No. 167,394
Int. Cl.[4] A61M 25/00; A61B 19/00
U.S. Cl. 604—93 **12 Claims**



1. A self-sealing injection reservoir adapted to be punctured by a hypodermic needle, the reservoir comprising:
a body defining a chamber for holding liquid, said body including a base;
a sheet of resilient elastic substance which has a tendency to curl into a natural configuration of a wall of a cylindrical tubing, the sheet being forcibly held in a flattened configuration relative to the aforesaid natural configuration whereby the interior side of the sheet is under compression, the convex wall of the natural configuration facing

towards the interior of the chamber, the sheet comprising at least an interior wall of the chamber and being disposed in a location of the chamber which is adapted to be punctured by the hypodermic needle;

duct means for conducting liquid out of the chamber, and

guard means incorporated in the chamber for preventing accidental puncture of the base with the hypodermic needle.

4,798,585

SUPPORT FOR BIOMEDICAL IMPLANT DEVICE

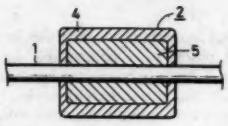
Masahide Inoue; Takeshi Ichitsuka; Yasuhiko Hirayama; Shozo Koshikawa, all of Tokyo; Tateki Kitaoka; Nobuo Nakabayashi, both of Chiba; Tatsumichi Takeda, Tokyo, and Osamu Minoo, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1987, Ser. No. 59,445

Claims priority, application Japan, Jun. 6, 1986, 61-131570

Int. Cl.[4] A61M *11/00*

U.S. Cl. 604—93 **17 Claims**



1. A biomedical implant device for implantation within tissue of a body, comprising: a support having a surface layer to be contacted with said tissue and composed of a biocompatible calcium phosphate material; and a medically operative part at least partially enclosed by said surface layer.

4,798,586

METHOD AND APPARATUS FOR AIDING DILATATION CATHETERIZATION

Robert C. Stevens, Williston, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Apr. 9, 1987, Ser. No. 36,223

Int. Cl.[4] A61M *29/00*

U.S. Cl. 604—96 **9 Claims**

4. A catheter system for cannulizing a blood vessel to increase blood flow through said blood vessel comprising:

(a) a flexible dilatation catheter having

(i) a balloon at its distal end for expanding the blood vessel,

(ii) an intermediate sheath defining a center passageway in communication with the blood vessel interior, and,

(iii) a proximal fitting outside a patient body having a first input in communication with the center passageway and a second input in fluid communication with the balloon;

(b) a drive catheter for insertion into the intermediate sheath of the flexible dilatation catheter and having a distal end defining a rotatable head for opening a lumen through deposits in the blood vessel, an elongated drive wire attached to the rotatable head for rotating the head, a sleeve for rotatably supporting the drive wire, a seal carried by the sleeve for impeding fluid entering a distal end of the sleeve from flowing out a proximal end of the sleeve and a coupling attached to a proximal end of said drive wire to rotate the drive wire;

(c) an adapter to mate with the dilatation catheter fitting and route the drive catheter into the central passageway of the dilatation catheter, said adapter including a seal to prevent fluid in the central passageway from leaking out the adapter along an outer surface of the drive catheter;

(d) drive means for rotating the drive catheter coupling to effect a rotation of the rotating head; and

(e) means for inflating the balloon by directing a fluid into said balloon through said second input after the balloon is pushed into the lumen formed by the rotating head.

4,798,587

DEVICE FOR REMOVING NEEDLES OR NEEDLE/SHEATH COMBINATIONS FROM HYPODERMIC SYRINGES

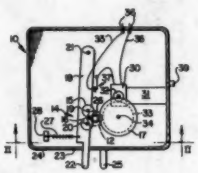
Graham M. Willoughby, 20 Ruskin Row, Winnipeg, Manitoba R3M 2R7, Canada

Filed Nov. 24, 1987, Ser. No. 124,575

Claims priority, application Canada, Sep. 18, 1987, 547225

Int. Cl.[4] B65F *1/16*

U.S. Cl. 604—110 **18 Claims**



1. A device for removing a hypodermic needle or a hypodermic needle and sheath combination from a hypodermic syringe, which comprises:

releasable gripping means for releasably gripping said needle or needle and sheath combination, said releasable gripping means being such that said needle or needle and sheath combination may move freely away from said gripping means when released; and

drive means associated with said gripping means for rotating said needle or needle and sheath combination when gripped by said gripping means.

4,798,588

CENTRAL VENOUS PRESSURE CATHETER AND METHOD FOR USING

Rene Aillon, 86 Crofut St., Pittsfield, Mass. 01201

Continuation-in-part of Ser. No. 855,927, Apr. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 677,519, Dec. 3, 1984, Pat. No. 4,601,706. This application Mar. 27, 1987, Ser. No. 31,258

The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

Int. Cl.[4] A61B *5/02*

U.S. Cl. 604—122 **8 Claims**

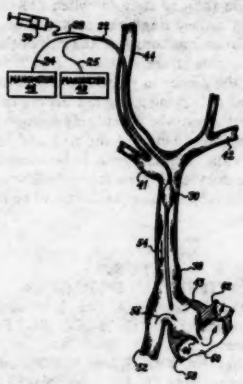
1. A central venous pressure catheter for insertion in the cava vein of a patient to prevent air aspiration through cut veins of the head or neck during surgery on the patient in an upright position comprising:

(a) an elongated flexible tube containing a plurality of lumens adapted for insertion into the superior cava vein of a patient via a jugular or subclavian vein;

(b) one distal port in a side wall of said tube and within 1 centimeter of the tip end of said tube, said one distal port being connected to a first of said lumens;

(c) a pneumatically or hydraulically inflatable balloon

mounted about and on the outside of said tube at a distance of from 5 to 12 centimeters away from said one distal port; and



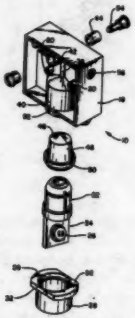
(d) a proximal port in said catheter side wall located on the other side of said balloon from said distal port.

4,798,589

DIAPHRAGM PUMP CASSETTE

Gus G. Taco, San Diego, Calif., assignor to Fisher Scientific Group Inc., San Diego, Calif.

Filed Jun. 15, 1987, Ser. No. 62,488
Int. Cl.[4] A61M 5/20
U.S. Cl. 604—152 8 Claims



1. A cassette for use in a volumetric infusion pump comprising:

a cassette body having a volumetric chamber disposed therein, said chamber including an opening such that a piston of corresponding size is capable of sliding into the chamber through the opening, said cassette body further comprising a base surrounding said opening;

a piston which is capable of reciprocating within said volumetric chamber;

means for allowing fluids to enter and leave the volumetric chamber in response to the reciprocating movement of the piston;

a diaphragm disposed between the piston and the volumetric chamber;

a cuff formed around the periphery of said diaphragm for attachment to said cassette body; and

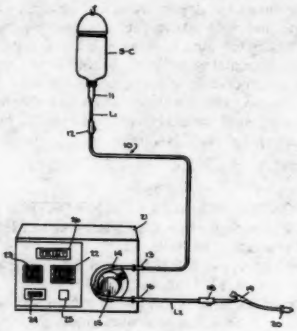
a diaphragm casing twistingly engageable with said cassette body by inserting said diaphragm casing into a first position and rotating said casing approximately 90 degrees into a second position for securing said cuff of said diaphragm between said casing and said base of said cassette body.

4,798,590

INTRAVENOUS INFUSION PUMPING SYSTEM INCLUDING INDEPENDENT PUMP SET

William J. O'Leary, Huntington; Thomas J. Hartnett, Jr., Greenlawn, both of N.Y., and Richard G. Jones, Lebanon, N.J., assignors to Medical Technology Products, Inc., Huntington, N.Y.

Filed Nov. 22, 1983, Ser. No. 554,617
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—153 6 Claims



1. An intravenous infusion system for supplying a therapeutic solution from a container therefor to a patient, said system comprising:

A. an independent pump set having a flow line extending from the container to the patient, said line having interposed therein a pump chamber constituted by a flexible tube terminating in an inlet connector and a transparent outlet connector each having a circular flange, the inlet connector flange being thicker than the outlet flange;

B. a rotor assembly block having a circular cavity within which is seated a rotor carrying a pair of diametrically-opposed rollers, the tube being looped in the cavity against an arcuate stator wall thereof, the flange of the inlet connector being seated in a matching slot of an inlet channel socket in the block leading to the cavity, and the flange of the outlet connector being seated in a matching slot of a parallel outlet channel socket in the block leading to the cavity which is dimensioned to accept only the outlet connector, thereby precluding reversal of the pump chamber, the rollers pressing the tube against the wall to occlude the tube and thereby trap the fluid therein;

C. a motor driving the rotor, whereby as the rotor turns, the points of occlusion are advanced to propel the fluid toward the outlet connector;

D. a light beam detector constituted by a light beam source disposed on one side of the transparent outlet connector to project a light beam therethrough and a photo sensor disposed on the opposite side of the outlet connector to intercept said beam to produce a control signal only when air passes through the outlet connector; and

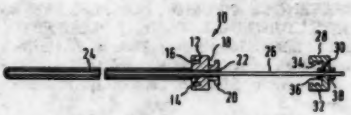
E. a motor control circuit coupled to said motor and responsive to said signal to arrest said motor to prevent air embolism.

4,798,591

CATHETER OBTURATOR

Yosuke Okada, Mori, Japan, assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Dec. 17, 1986, Ser. No. 943,273
Claims priority, application Japan, Dec. 18, 1985, 60-284729
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—164 5 Claims



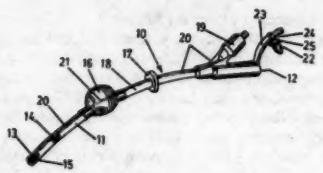
1. An improved combination of a catheter, having a specified internal diameter, and a catheter obturator, having a resilient obturator tube with an external diameter that is at least the catheter internal diameter when said obturator tube is in a relaxed state and is less than the catheter internal diameter when said obturator tube is in an elongated state, a stopper attached to a proximal end of said obturator tube, and manipulating means connectable to said stopper for selectively elongating and relaxing said obturator when said obturator tube is disposed within said catheter with the catheter internal and obturator external diameters aligned.

4,798,592

GASTROSTOMY FEEDING DEVICE

Stephen K. Parks, Sunnyvale, Calif., assignor to Medical Innovations Corporation, Milpitas, Calif.

Continuation of Ser. No. 670,381, Nov. 5, 1984. This application Oct. 13, 1987, Ser. No. 107,117
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] A61M 25/02
U.S. Cl. 604—49 19 Claims



1. A gastrostomy catherter device for feeding into a patient's stomach, comprising:

a. an elongate feeding tube having a feeding inlet end and a perforated outlet end for discharging food, the feeding tube extending outwardly from the patient's stomach to support external components of the device;

b. an expandable structure mounted on the tube near the outlet end;

c. means to expand the expandable structure;

d. a closure plug for the feeding inlet and secured to the feeding tube by an integral band;

e. an adjustable ring slidably mounted along the feeding tube, and medially thereof, and sized to frictionally engage the tube; whereby:

i. when the expandable structure is deflated, the feeding tube may be inserted through a stoma and into the patient's stomach;

ii. when the expandable structure is inflated, it is adapted to form a seal within the patient's stomach and adjacent the stoma;

iii. securement of the ring to the tube being provided solely by frictional engagement therebetween, the ring and tube both being made of silicone material, to secure the device within the patient's body and to prevent undesirable movement of the ring along the tube, whether in the dry state or when lubricated by body fluids, the locking ring being manually adjustable along the tube to accommodate to the size of the patient, and the expandable structure and ring both functioning to maintain the device in place in the patient;

iv. retraction of the ring along the feeding tube away from the patient's body being entirely against frictional engagement forces between the ring and tube to enable the stoma and adjacent areas to be cleaned; and,

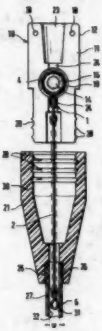
v. when the expandable structure is deflated, retraction of the feeding tube enables the device to be removed from the patient.

4,798,593

STIFFENING OF PROBES

Peter Iwatschenko, Neunkirchen, Fed. Rep. of Germany, assignor to Pfrummer-Viggo GmH+Co. KG, Erlangen, Fed. Rep. of Germany

Continuation of Ser. No. 806,739, Dec. 9, 1985, abandoned. This application Mar. 10, 1987, Ser. No. 23,992
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444935
Int. Cl.[4] A61M 5/18
U.S. Cl. 604—164 8 Claims



1. A guide for the stiffening of probes which are made of flexible material and in which the guide is disposed during insertion of the probe into a body cavity and is withdrawn from the probe after the probe has been inserted into the body cavity, comprising a single elongated wire guide element adapted to be inserted into and withdrawn from said probe, a coating on said wire guide element made of a biocompatible material of which at least the surface is hydrophilic, a connector fastened to an outer end of said wire guide element, said connector having a first coupling means for coupling said connector to said probe, and a second coupling means for coupling a lubricant-introducing device to said connector, said connector further having a passage providing communication between said first and second coupling means.

4,798,594

MEDICAL INSTRUMENT VALVE

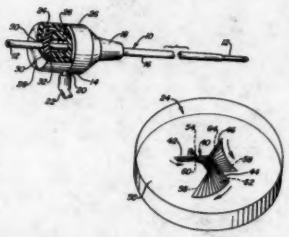
Richard A. Hillstead, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Sep. 21, 1987, Ser. No. 99,139
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—167 27 Claims

1. A medical instrument comprising a housing, said housing including a valve for receiving and sealing and elongated

member which penetrates said valve, said valve comprising an elastomeric partition member having a first face and a second opposed face and adapted for securement in a housing, the improvement comprising, in combination:

a slit extending through said valve between said first and



second faces, said slit defining a first line on said first face and a second line on said second face, said first line and said second line having a similar configuration but being in non-alignment with each other with a generally helical slit section extending between said first line and said second line.

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INJECTION DEVICE

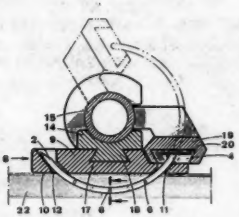
Ingvar Andersson, Pl 80, S-450 34 Fiskebäckskil, and Jan Wadstein, Jaktvarvsvägen, S-133 00 Slatsjöbaden, both of Sweden

PCT No. PCT/SE86/00396, § 371 Date Apr. 29, 1987, § 102(e) Date Apr. 29, 1987, PCT Pub. No. WO87/01292, PCT Pub. Date Mar. 12, 1987

PCT Filed Sep. 9, 1986, Ser. No. 51,958

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—174 **2 Claims**



1. An injection arrangement comprising an injection needle which is curved so that at least one part of it is shaped in a circular arc with a certain radius of curvature, said needle having a solid cutting tip and a central duct extending therethrough to said solid cutting tip, said needle having a plurality of openings on the circular arc shaped part communicating with the duct;

a base plate having two curved ducts passing through the plate at an angle to one another with the same radius of curvature as the needle;

a cradle supported by the base plate, to which the needle is attached, said cradle having the ability to move in the base plate in such a way that the needle is able to move in a normal plane to the plane of the base plate in a reciprocating fashion about the center of the radius of curvature, whereby during forward movement, the tip of the needle moves from a first end position down through the first curved duct and then up through the second duct to a second end position.

4,798,596

APPLICATOR SYRINGE FOR A DENTAL COMPOUND

Ernst Mühlbauer, Elbgaustrasse 248, Hamburg, Fed. Rep. of Germany

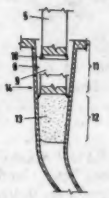
PCT No. PCT/EP86/00570, § 371 Date May 29, 1987, § 102(e) Date May 29, 1987, PCT Pub. No. WO87/01929, PCT Pub. Date Apr. 9, 1987

PCT Filed Oct. 6, 1986, Ser. No. 60,245

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1985, 8528512[U]

Int. Cl.[4] A61C *5/04*

U.S. Cl. 604—218 **7 Claims**



1. A disposable applicator syringe for a dental compound, comprising:

a tubular member made from an elastically yielding polymeric material having a rear entrance end portion, a front discharge end portion, an intermediate portion between the end portions, and a continuous, substantially cylindrical central channel extending from the entrance end portion to the discharge end portion through the intermediate portion, the channel at least in the intermediate portion having a smaller diameter than the channel in the entrance end portion, and the intermediate portion being adapted for receiving a predetermined quantity of dental compound to be discharged through said discharge end portion; and

a piston in the form of an elongated rod having a head portion, the piston adapted to be manually advanced through the entrance end portion and the intermediate portion into contact with the dental compound, the head of the piston having a useful stroke in the intermediate portion while advancing the compound through the channel, said useful stroke being equal to at least about ten times the diameter of the channel in the intermediate portion, the diameter of the piston head being less than the diameter of the channel in the entrance end portion, and approximately equal to the diameter of the channel at the transition from the entrance end portion to the intermediate portion, and the channel being continuously tapered at least through the entrance and intermediate portions.

4,798,597

FLEXIBLE COMPOSITE INTUBATION TUBE

Vincent L. Vaillancourt, 30A Ridgedale Ave., East Hanover, N.J. 07936

Filed Apr. 29, 1987, Ser. No. 43,865

Int. Cl.[4] A61M *25/00*

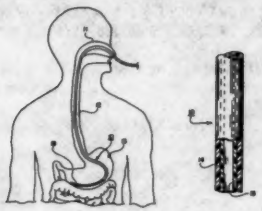
U.S. Cl. 604—270 **16 Claims**

1. A flexible composite intubation tube for connection to a bolus comprising

a relatively thin outer layer of plastic material characterized in being pliable and flexible; and

an inner concentric layer of plastic material defining a flow path for a fluid, said inner layer having an inner diameter of 0.080 inches and being made of a hydrophilic polymer characterized in being stiff in a dry state and in being very soft and flexible in a wetted state; said layers forming a tube characterized in being sufficiently pliable and self-

supporting to be inserted per se into a naso-gastric passage and in being soft and flexible in a wetted state within the



naso-gastric passage to avoid creating pressure points therein and without closing said lumen.

4,798,598

GUIDE FOR A CATHETER

Philippe Bonello, Geneva, and Maurice Jeanmonod, Meyrin, both of Switzerland, assignors to Sarcem S.A., Meyrin, Switzerland

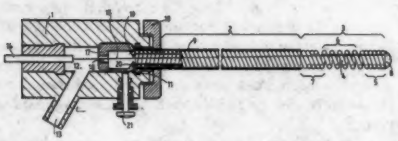
Filed Apr. 28, 1987, Ser. No. 42,651

Claims priority, application Switzerland, May 23, 1986, 2083/86; Jan. 28, 1987, 289/87

The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

Int. Cl.[4] A61M *21/00*

U.S. Cl. 604—280 **9 Claims**



1. In a catheter guide comprising a head formed by a coil spring having a central zone wherein the coils are spaced apart and two zones on opposite sides of said central zone wherein the coils of the spring abut each other, said head having a closed free end and a tubular element connecting said head to a control housing to which said head is removably secured, a control device for bending the head comprising a control member sliding in the housing and connected to a traction member passing through said housing and through the tubular element and the coil spring and eccentrically connected to said free end, and a cutter for the traction member carried by said control housing; the improvement in which the tubular member is comprised along at least a portion of its length by a coil spring having abutting coils covered by a fluid tight coating of plastic material.

4,798,599

EYE WASHING METHOD AND APPARATUS

George Thomas, 10611 99th St. S.W., Tacoma, Wash. 98498

Filed Jan. 3, 1984, Ser. No. 567,646

Int. Cl.[4] A61M *7/00*

U.S. Cl. 604—290 **9 Claims**

1. A method for washing an eye comprising:

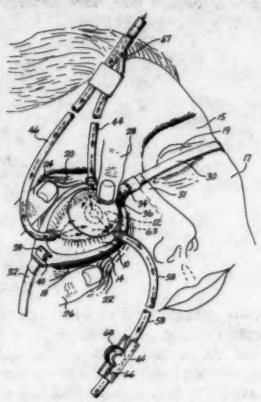
providing an eyecup having a rim portion that complementarily fits to the orbit portion which surrounds an eye on the face of a person;

placing the eyecup over the eye to form a liquid confining chamber adjacent the eye;

drawing the skin above and below the eye away from the eye;

pushing the eyecup against the skin such that the rim portion of the eyecup puts pressure on said skin above and below the eye for holding the eye open;

delivering liquid eyewash into the chamber and against a



surface of the eye which is spaced a distance from the corneal portion of the eye to produce a washing action; and

draining the eyewash from the chamber.

4,798,600

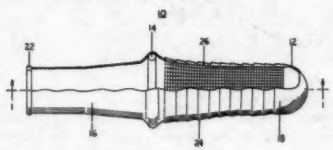
CONDOM DEVICE AND METHOD FOR USING SAME

Michael E. Meadows, 37 James Rd., Hatboro, Pa. 19040

Filed Jun. 12, 1987, Ser. No. 61,890

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—347 **36 Claims**



1. A condom to be worn by a male during sexual intercourse with a second partner comprising

a flexible sheath having an interior surface, an exterior surface, an open-ended external to the second partner male portion, a closed-ended female portion and, centering means being provided intermediate the ends of the sheath, separating the male portion and the female portion;

said male portion having means to attach to a penis and to seal said open end;

said female portion being bodily inserted up to but not including said centering means and remaining relatively stationary during intercourse; and

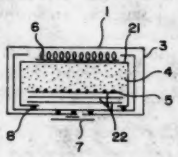
said male portion being adapted to fold, allowing the penis to move into and out of the female portion of said sheath during intercourse.

4,798,601

SANITARY NAPKIN

Toshihiro Shirose, and Akira Sakurai, both of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 26, 1987, Ser. No. 53,677
Claims priority, application Japan, May 26, 1986, 61-79396[U]; Jul. 25, 1986, 61-114336[U]
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—368 7 Claims



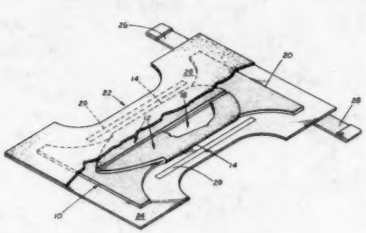
1. A sanitary napkin which comprises a liquid-permeable surface material, a liquid-impermeable leakproof material and an absorber inserted between said surface material and said leakproof material, said absorber comprises a first absorber and a second absorber having been placed on said first absorber and having a smaller width than said first absorber, said leakproof material covering at least the bottom surface, both side surfaces and a portion of the top surface of said first absorber and a portion of the side surfaces of said second absorber, and said surface material covering at least a portion of said leakproof material and the top surface of the second absorber and wherein fixation is made between (a) said first absorber and said second absorber, (b) said surface material and said leakproof material and (c) said leakproof material and said first or second absorber.

4,798,602

DISPOSABLE LIQUID-ABSORBENT PRODUCTS

Guy G. Laus, Rixensart, Belgium, assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Mar. 4, 1986, Ser. No. 836,261
Int. Cl.[4] A61F *13/16, 13/18, 13/20*
U.S. Cl. 604—372 3 Claims



1. A disposable liquid absorbent garment comprising in combination

(a) a liquid impervious outer layer comprising a blend of

(i) 25 to 55 parts by weight of Ethylene Propylene (EPM) or Ethylene Propylene Diene (EPDM) elastomer having an ethylene content of 45 to 80 weight percent;

(ii) 35 to 55 parts by weight of a thermoplastic ethylene-vinyl acetate copolymer having a vinyl acetate content of 9 to 40% by weight;

(iii) 5 to 25 parts by weight of a normally liquid hydrogen process oil, the oil being an aromatic, highly aromatic napthenic or paraffinic or extender oil;

(iv) 0 to 30 parts by weight of calcium carbonate filler, and

(v) 0 to 2% by weight, based on the total composition, of a film processing adherent;

the blend composition containing at least 4.5% by weight vinyl acetate blend upon the total weight of the blend composition and the blend composition having a melt index at 190° C. (2.16 kg load) of 0.5 to 15 g/10 min.;

(b) a liquid permeable liner; and

(c) an intermediate absorbent layer having one side in contact with the liquid impervious outer layer and its opposite side in contact with the liquid permeable liquid liner.

4,798,603

ABSORBENT ARTICLE HAVING A HYDROPHOBIC TRANSPORT LAYER

Stephen C. Meyer, Cobb County; Roger L. Lance, Gwinnet County, both of Ga.; Connie L. Hetzler, Winnebago County, Wis.; Cedric A. Dunkerly, II, Outagamie County, Wis.; Thomas H. Roessler; David L. Zenker, both of Winnebago County, Wis., and Michael A. Sciaraffa, Outagamie County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 16, 1987, Ser. No. 109,784
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—378 52 Claims

1. An absorbent article, comprising:

an absorbent body composed of a substantially hydrophilic material which is capable of absorbing liquid;

a liquid permeable topsheet layer superposed in facing relation with said absorbent body and having an effective average pore size therein;

a liquid permeable transport layer located between said topsheet layer and said absorbent body, and composed of a material which is less hydrophilic than said absorbent body, said transport layer having an effective average pore size therein which is smaller than said topsheet layer pore size.

4,798,604

CONTOURED FILM

Andrew J. Carter, Saffron Walden, United Kingdom, assignor to Smith and Nephew Associated Companies p.l.c., United Kingdom

PCT No. PCT/GB86/00504, § 371 Date Apr. 15, 1987, § 102(e) Date Apr. 15, 1987, PCT Pub. No. WO87/01029, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 26, 1986, Ser. No. 52,855
Claims priority, application United Kingdom, Aug. 24, 1985, 8521254
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—383 29 Claims

1. A water permeable, contoured polymeric film which comprises a film containing apertures and which has a pattern of raised areas therein, in which the film is formed from elastomeric polymer and in which the ratio of apertures to raised areas is greater than unity.

4,798,605

DEVICE FOR CONNECTING AND DRAINING A POUCH

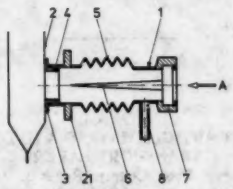
Roland Steiner, Thun, and Eugène Van Meir, Fribourg, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Jul. 21, 1987, Ser. No. 76,177

Claims priority, application European Pat. Off., Aug. 1, 1986, 86110670.6

Int. Cl.[4] A61B *19/00*

U.S. Cl. 604—411 7 Claims



1. A device which is adjustable and for being affixed to a joint affixed to a pouch containing liquid for continuously draining the pouch comprising:

an end-piece of the device displaced from an end portion of the device, the end portion being capable of being affixed to a joint affixed to a pouch containing liquid to be dispensed;

means connecting the end-piece with the affixing end portion for reciprocation of the end-piece in a direction towards and in a direction away from the affixing end portion, the end-piece, the reciprocation means, the affixing end portion and the joint defining a void for liquid from a pierced pouch to flow towards the end-piece;

a needle affixed to the end-piece and extending within the void, the needle being affixed to the end-piece for having an axis of symmetry substantially corresponding with an axis of symmetry of the void, being tapered to a point in a direction from the end-piece to the affixing end portion, having a length such that when the end-piece is at a reciprocated position away from the affixing end portion, the point of the needle is displaced away from the pouch but having a length sufficient for penetrating through the joint for piercing the pouch when the end-piece is at a reciprocated position towards the affixing end portion and having a diameter smaller than a diameter of the void; and

a pipe positioned between the end-piece and the reciprocation means for dispensing liquid flowing from a pierced pouch via the void about the needle towards the end-piece.

4,798,606

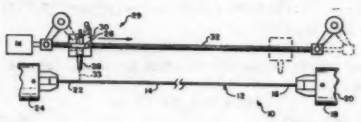
REINFORCING STRUCTURE FOR CARDIOVASCULAR GRAFT

Leonard Pinchuk, Miami, Fla., assignor to Corvita Corporation, Miami, Fla.

Division of Ser. No. 705,782, Feb. 26, 1985, Pat. No. 4,629,458. This application Aug. 27, 1986, Ser. No. 900,776

Int. Cl.[4] A61F *2/06*

U.S. Cl. 623—1 21 Claims



1. A method of forming a reinforced cardiovascular graft comprising the steps of:

extending a segment of a monofilament between the chucks of a lathe;

rotating the lathe chucks to rotate the monofilament;

spraying the rotating monofilament with a continuous fluid polymer strand in a predetermined manner to form a fibrous layer that provides a textured surface to the monofilament;

winding the textured surface monofilament around a mandrel to form a coil with predetermined pitch and inner diameter;

placing the coil around a silicone rubber rod;

inserting the rod with the coil thereon into the body of an animal where collagen can grow around the rod and between turns of and into the coil;

after ingrowth of collagen between turns of and into the coil to form a collagen sleeve incorporating said coil, removing the rod with collagen sleeve therearound; and,

pulling the graft comprising the collagen sleeve with reinforcing monofilament therein off the silicone rubber rod.

4,798,607

PROCESS OF CROSSLINKING A POLYURETHANE PROSTHESIS WITH A HALOALKYLISOCYANTE

Ian P. Middleton, 15, Tinway Drive, West Derby, Liverpool, United Kingdom L12, 4YR, and Jerzy Paprotny, ul. Mewy 5/41, 44-100 Gliwice, Poland

Filed Jun. 15, 1987, Ser. No. 61,758

Claims priority, application United Kingdom, Jul. 4, 1986, 8616416

Int. Cl.[4] A61F *2/06*

U.S. Cl. 623—1 12 Claims

1. A process for producing a medical prosthesis, comprising forming the prosthesis from an uncross-linked polyurethane and then at least partially cross-linking the polyurethane with a cross-linking agent, by treating the prosthesis with a vaporizable halo alkyl isocyanate and reacting said isocyanate with said polyurethane by vaporizing the isocyanate at a temperature below that temperature at which the polyurethane in its uncross-linked form tends to degrade and soften.

4,798,608

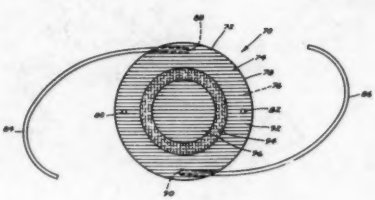
LAMINATED ZONE OF FOCUS ARTIFICIAL LENS

Dennis T. Grendahl, 2070 Shoreline Dr., Orono, Minn. 55416

Filed Aug. 24, 1987, Ser. No. 88,428

Int. Cl.[4] A61F *2/16*

U.S. Cl. 623—6 8 Claims



1. A laminated zone of focus lens for use with an eye comprising:

a. two or more optical lamination elements including a first lamination element encompassing a first area of said lens;

b. a second lamination element encompassing a second area of said lens;

c. said first lamination element, in combination with said second lamination element serving to create an image of a first distinct portion of the retina;

d. said second lamination element serving to simultaneously create an image on a second distinct portion of the retina which is different from said first portion; and,

e. at least two of said lamination elements being of different colors.

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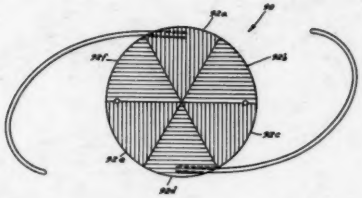
RADIALLY SEGMENTED ZONE OF FOCUS ARTIFICIAL LENS

Dennis T. Grendahl, 2070 Shoreline Dr., Orono, Minn. 55416

Filed Aug. 24, 1987, Ser. No. 88,249
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 **18 Claims**



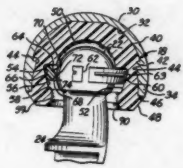
1. A zone of focus lens for use with an eye comprising:
a. a plurality of pie-shaped optical elements joined at the sides to form a unitary lens structure having a front surface, a rear surface and a circular periphery;
b. each of said pie-shaped elements serving to create an image on a distinct portion of the retina;
c. at least two of said elements having different powers whereby objects at different distances from the eye are simultaneously brought to a focus on distinct portions of the retina; and
d. at least two of said pie-shaped optical elements are of different colors.

4,798,610

PROSTHETIC IMPLANT DEVICE

Robert G. Averill, Ringwood, and Alex Khowaylo, Allendale, both of N.J., assignors to Osteonics Corp., Allendale, N.J.

Filed Sep. 29, 1982, Ser. No. 427,010
Int. Cl.[4] A61F 2/34
U.S. Cl. 623—22 **4 Claims**



1. In an implantable prosthetic joint for use in replacement of the ball end of a biological joint, said prosthetic joint having a spherical head for insertion into and seating in the natural socket of the joint, a bearing in said spherical head, said bearing including an inner spherical dome having an entrance end and an outwardly extending recess located axially between the entrance end and the inner spherical dome, the recess extending circumferentially around the bearing and having a laterally outwardly extending upper end wall and an outer wall extending downwardly from said upper end wall and sloping downwardly and inwardly toward the entrance end, a ball-shaped member for being seated in said inner spherical dome of said bearing, the relative dimensions of the ball-shaped member and the entrance end enabling the ball-shaped member to be inserted into and selectively released from the bearing through the entrance end, and a radially-expansible ring placed between the bearing and a portion of the ball-shaped member when the ball-shaped member is seated in the inner spherical dome for capturing the ball-shaped member in the bearing, the ring having an upper end wall confronting the upper end wall of the recess, an outer wall sloping downwardly and inwardly for contacting said outer wall of said recess and an arcuate wall for contacting said ball-shaped member when the ball-shaped member is urged downwardly against the ring by downward forces tending to disengage the ball-shaped member from the inner spherical dome, the length of the outer sloping wall of said ring being substantially shorter than the length of the outer sloping wall of said recess for permitting said ring to slide upwardly toward an upper position wherein the ring will expand in said recess in response to contact with the ball-shaped member as the ball-shaped member is inserted through the entrance end into the bearing toward the inner spherical dome, until said ball-shaped member can pass through said ring to permit said ring to slide downwardly in said recess away from said recess upper end wall and between said outer sloping wall of said recess and said ball-shaped member, beneath the ball-shaped member, upon the application of downward forces to said ball-shaped member, the improvement wherein:

the recess includes a laterally inwardly extending lower end wall confronting the upper end wall of the recess and spaced axially downwardly from the recess upper end wall a distance great enough to permit movement of the ring independent of the ball-shaped member in axial directions between said upper position and a lower position wherein contraction of the ring beneath the ball-shaped member by contact with the outer wall of the recess will capture the ball-shaped member in the bearing, between the inner spherical dome and the arcuate wall of the ring, and to permit said ring to be pushed selectively by a disengagement tool upwardly toward said upper position in said recess independent of the ball-shaped member so that said ring will be expanded outwardly sufficiently for said ball-shaped member to be withdrawn through said ring and said entrance end to be released selectively from said bearing; and

the ring includes a lower end wall confronting the lower end wall of the recess such that movement of the ring downwardly beyond the recess lower end wall and consequent disengagement of the ring from the recess will be precluded by contact between at least portions of the ring lower end wall and the recess lower end wall, thereby preventing inadvertent disengagement of the ball-shaped member from the spherical head.

4,798,611

ENHANCEMENT OF XENOGENEIC TISSUE

Donald C. Freeman, Jr., Newport Beach, Calif., assignor to Hancock Jaffe Laboratories, Irvine, Calif.

Filed Oct. 14, 1986, Ser. No. 918,280
Int. Cl.[4] A61F 2/54
U.S. Cl. 623—66 **8 Claims**

1. The method of preparing a xenogeneic tissue from animal tissue structures such as tendons, ligaments, pericardial membrane, skin, umbilical cord, and the like, without disintegration or comminution and reconstitution, for implantation comprising the steps of:

(a) removing excess tissue and fat from a tissue structure of an animal;

(b) cutting the tissue structure to a desired size and configuration;

(c) treating the tissue structure resulting from the preceding steps (a) and (b) with a chemical cross-linking reagent to effect cross-linking of the tissue constituents; and, thereafter

(d) irradiating the tissue structure resulting from step (c) with high energy X-radiation or gamma radiation with from about two times to about five times the amount of such radiation as is necessary to sterilize said tissue structure, said amount of radiation being sufficient to sterilize the tissue structure but less than the amount of radiation which significantly (i) reduces shrink temperature T_s, (ii) increases the extractability of degradation products, and (iii) decreases the tensile strength of the tissue structure, and which renders the tissue structure more flexible and compliant, and less antigenic than the unirradiated tissue structure.

4,798,612

MODIFIED SUCCINIMIDES (X)

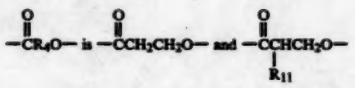
Frank Plavac, Novato, and Robert H. Wollenberg, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 820,188, Jan. 17, 1986, Pat. No. 4,680,129. This application Jul. 14, 1987, Ser. No. 73,024

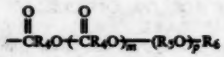
Int. Cl.[4] C10L *1/22, 1/18*

U.S. Cl. 44—63 14 Claims

1. A fuel composition comprising a hydrocarbon boiling in the gasoline or diesel range and from about 10 to about 10,000 parts per million of a polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with:



wherein R_4 is alkylene of from 1 to 6 carbon atoms excluding R_4 groups wherein



wherein R_{11} is the remainder of the R_4 group; m is an integer of from 0 to 2; R_5 is alkylene of from 2 to 5 carbon atoms; p is an integer of from 1 to 100; R_6 is selected from the group consisting of hydrogen and hydrocarbyl of from 1 to 30 carbon atoms; and with the proviso that if m is one or two, then R_6 is hydrogen.

4,798,613

SURFACE CLEANING APPARATUS

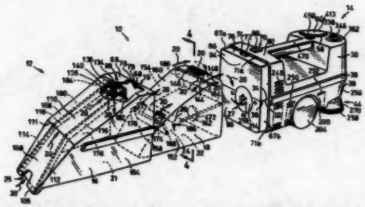
Michael W. Hetherington, Cedar Valley; David P. Garner, Niagara Falls, and Allan D. Millman, Toronto, all of Canada, assignors to Ionx Appliances Inc. and Apparells Ionx Inc., both of Welland, Canada

Filed Sep. 2, 1986, Ser. No. 902,591

Claims priority, application Canada, Sep. 5, 1985, 490105

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—52 52 Claims



1. In a vacuum surface cleaning apparatus an elongated passageway having an inlet at one end and an outlet at the other end and a recovery chamber portion having a top opening therein in communication with said elongated passageway intermediately of the extent thereof, said elongated passageway including a first section extending from said inlet to an elevated region thereof remote from said inlet and above said recovery chamber portion, an intermediate section in communication with said first section in said elevated region thereof and extending therefrom to overlie and communicate with said top opening of said recovery chamber portion with the flow path cross sectional area of said intermediate section exceeding the flow path cross sectional area of said first section, and a third section in communication with said intermediate section in the region thereof above said top opening and extending therefrom toward said outlet.

4,798,614

PROCESS AND DEVICE FOR COOLING

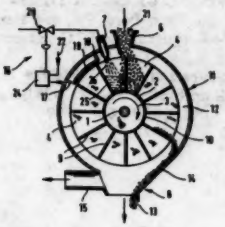
Nestor Aubry, Brussels; Armand Couder, Zaventem, and Andre Weverbergh, Overijse, all of Belgium, assignors to Messer Griesheim GmbH, Frankfurt, Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 29,258

Claims priority, application Belgium, Mar. 25, 1986, 904485

Int. Cl.[4] F25D *17/02*

U.S. Cl. 62—374 11 Claims



1. In a device for cooling, expecially deep freezing, of products such as foodstuffs and industrial products by means of a refrigerant liquid, the improvement being in a transport mechanism, said transport mechanism comprising a drum rotatably mounted on an axle in a particular direction, a plurality of radially extending partitions in said drum dividing said drum into a number of compartments, a product loading device disposed above said drum for feeding the products to be cooled into said compartments as said drum is rotating, a refrigerant liquid loading device for feeding refrigerant liquid into said compartments to mix with the products therein, and a removal device downstream from said loading devices for receiving the cooled products discharged from said drum before said drum makes a complete revolution.

4,798,615

PROCESS FOR MAKING A FILTER FOR MOLTEN METAL HAVING A HIGH MELTING POINT

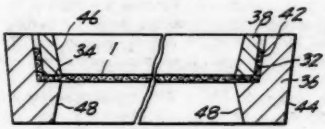
Shigemi Fukata, Osaka; Toshinari Amakasu; Ken Ugata, both of Nara, and Shoichi Yoshino, Osaka, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Oct. 17, 1986, Ser. No. 919,962

Claims priority, application Japan, Oct. 19, 1985, 60-235032; Feb. 10, 1986, 61-18618[U]; Apr. 14, 1986, 61-56445[U]

Int. Cl.[4] B01D *29/36*; D03D *15/04*

U.S. Cl. 65—4.4 4 Claims



1. A process for producing a filter in the form of a woven net of SiO_2-containing glass fibers for filtering molten metal comprising the steps of:

(a) weaving glass yarns into a netlike filter, each of the glass threads being prepared by bundling and twisting together glass fibers composed cheifly of silica,

(b) subjecting the netlike filter to an acid treatment to in-

crease the SiO_2 content of the glass fibers to at least 75 wt. % and

(c) thermally curing the resulting filter to contract the pores in the glass fibers until a shrinkage of 2.5 to 15% is obtained, said shrinkage being expressed by

$$(l-l')/\times 100\ \%$$

wherein l is the length of the fiber before the thermal cure, and l' is the length of the thermally cured fiber.

4,798,616

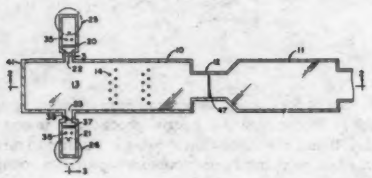
MULTI-STAGE PROCESS AND APPARATUS FOR REFINING GLASS OR THE LIKE

Leonard A. Knavish, Plum Boro, Pa., and David R. Haskins, Cumberland, Md., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 914,228, Oct. 2, 1986, abandoned. This application Aug. 31, 1987, Ser. No. 91,178

Int. Cl.⁴ C03B 5/10

U.S. Cl. 65—135 **18 Claims**



1. In a method of making glass or the like wherein batch material is liquefied in a first vessel from which the liquefied material flows in an incompletely melted condition and is passed to a separate refiner vessel in which a volume of the material is gathered and heated so as to refine the material, and the refined material is withdrawn from an outlet at one end of the refiner, the improvement comprising receiving the incompletely melted material from the liquefying vessel in an intermediate vessel, heating the material in the intermediate vessel so that the material is passed from the intermediate vessel to the refiner at a temperature between the highest and lowest temperatures of the material in the refiner, maintaining a high temperature zone of the material in the refiner at a location between the outlet and an opposite rear end, maintaining a decreasing temperature gradient between the high temperature zone and the rear end so as to induce a rearward surface flow of material from the high temperature zone toward the rear end thereby establishing a horizontally elongated recirculating flow pattern that serves to extend the residence time of the material in the refiner, passing the material from the intermediate vessel into the refiner at a location between the high temperature zone and the rear end so as to enter directly into the rearward surface flow.

11. Apparatus for making glass or the like comprising:

a liquefying vessel having means for feeding pulverulent batch material into the vessel, means for heating the interior of the vessel to a liquefying temperature of the batch material, and a batch support surface extending to a drain opening;

a channel aligned with the drain opening adapted to receive liquefied material from the liquefying vessel, means for heating the liquefied material in the channel;

a refining vessel communicating with the channel so as to receive molten material from the channel, the refining vessel having a substantially greater area than the channel, means for heating the material in the refining vessel adapted to provide a relatively high temperature zone in a portion of the material in the refiner, and an outlet opening for withdrawing molten material from the refining vessel at a location spaced from the channel;

wherein the refining vessel has a longitudinal dimension extending horizontally from a back wall toward the outlet opening with side walls extending substantially in the longitudinal direction, and the channel communications with the interior of the refining vessel through an opening in a side wall portion between the back wall and the high temperature zone.

4,798,617

METHOD OF FORMING A PARISON IN THE MANUFACTURE OF HOLLOW ARTICLES OF GLASSWARE

Thomas V. Foster, Doncaster; Stanley P. Jones, Tickhill, both of England, and David L. Alderson, Simsbury, Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

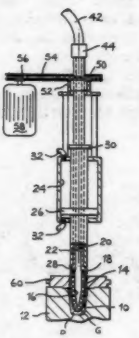
Continuation of Ser. No. 821,636, Jan. 23, 1986, Pat. No. 4,682,996. This application Mar. 26, 1987, Ser. No. 31,072

Claims priority, application United Kingdom, Jan. 26, 1985, 8501991

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.⁴ C03B 11/12

U.S. Cl. 65—25.1 **15 Claims**



1. A method of forming articles of glassware comprising:

introducing a gob of molten glass into a blank mold cavity having the shape desired for the external surface of a parison,

inserting a plunger into the blank mold cavity to cause the gob to conform to the blank mold cavity forming a hollow parison between the plunger and the blank mold cavity,

removing the formed parison and transferring it to a finish mold in which each parison will be blown to the shape of the required article, and

maintaining the initial heat within the parison by providing a gaseous layer having sufficient insulation properties to limit the heat transfer from the highly heated parison to said plunger to reduce the consequent temperature drop of the parison before it is transferred to the blank mold cavity.

4,798,618

NOVEL CHLOROACETANILIDE DERIVATIVES AND HERBICIDES CONTAINING THE SAME FOR USE IN PADDY FIELD

Shiazo Someya, Tokorozawa; Rokuro Akahira, Tokyo; Hiroshi Horino, Yokohama; Michihiro Ohnaka, Yokohama, and Takashi Kiuchi, Yokohama, all of Japan, assignors to Agro-Kanesho Co., Ltd., Tokyo, Japan

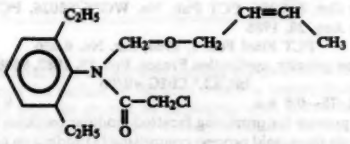
Filed Dec. 7, 1982, Ser. No. 447,651

Claims priority, application Japan, Dec. 10, 1981, 56-199058; Oct. 12, 1982, 56-178699

Int. Cl.[4] A01N *43/48, 37/18*

U.S. Cl. 71—92 3 Claims

1. A herbicide for paddy fields containing 2/, 6/-diethyl-N-[(2-cis-butenoxy) methyl]-2-chloroacetanilide represented by the formula



as its active ingredient.

2. A herbicide composition for paddy fields containing 2/, 6/- diethyl-N- [(2-cis-butenoxy) methyl]-2-chloro-acetanilide and 1,3-dimethyl-4-(2,4-dicholorobenzoyl) -5-pyrazolyl-4-toluenesulfonate as its active components.

4,798,619

2-(2-IMIDAZOLIN-2-YL)-PYRIDINES AND QUINOLINES AND USE OF SAID COMPOUNDS AS HERBICIDAL AGENTS

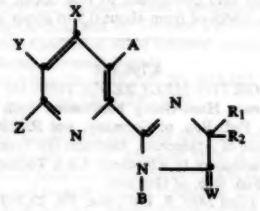
Marinus Los, Pennington, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Division of Ser. No. 382,041, May 25, 1982, Pat. No. 4,638,068, which is a continuation-in-part of Ser. No. 252,704, Apr. 8, 1981, abandoned, and a continuation-in-part of Ser. No. 155,909, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,910, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,867, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,908, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,865, Jun. 2, 1980, abandoned. This application Apr. 10, 1986, Ser. No. 850,192

Int. Cl.[4] A01N *43/40, 43/42*; C07D *213/30, 215/14*

U.S. Cl. 71—66 61 Claims

32. A method for the control of monocotyledonous and dicotyledonous annual, perennial and aquatic plant species comprising: applying to the foliage of the plants or to soil or water containing seeds or other propagating organs thereof, a herbicidally effective amount of a compound having a structure:

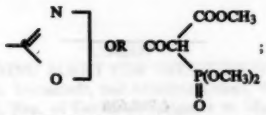


wherein

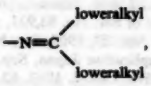
R_1 is C_1–C_4alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl;

A is $COOR_3$, $CONHR_6$, CHO, CH_2OH, $COCH_3$, COC_6H_5, CN, CH_3, CH=NOH, CH_2COOH, CONHOH, CH_2CH_2COOH, CHR_8OH,



R_3 is hydrogen,



C_1–C_{12} alkyl optionally substituted with one of the following groups: C_1–C_3 alkoxy, halogen, hydroxyl, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, halophenyl, loweralkylphenyl, loweralkoxyphenyl, nitrophenyl, carboxyl, loweralkoxycarbonyl, cyano or triloweralkylammonium halide;

C_3–C_{12} alkenyl optionally substituted with one of the following groups: C_1–C_3 alkoxy, phenyl, halogen or loweralkoxycarbonyl or with two C_1–C_3 alkoxy groups or two halogen groups;

C_3–C_6 cycloalkyl optionally substituted with one or two C_1–C_3 alkyl groups;

C_3–C_{16} alkynyl; or

A cation;

R_6 is hydrogen, hydroxyl, C_3-alkenyl, C_3-alkynyl or C_1–C_4 alkyl optionally substituted with one hydroxyl or one chlorine group;

B is H, COR_4 or SO_2R_5, provided that when B is COR_4 or SO_2R_5, A is CH_3, CN, or $COOR_3$ in which R_3 is other than H or a cation, W is O; and Y and Z are not alkylamino, hydroxyl, or hydroxyloweralkyl;

R_4 is C_1–C_{11} alkyl, chloromethyl or phenyl optionally substituted with one chloro, one nitro or one methoxy group;

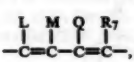
R_5 is C_1–C_4 alkyl or phenyl optionally substituted with one methyl group;

W is O or S;

R_8 is C_1–C_4-alkyl or phenyl;

X is hydrogen, halogen, hydroxyl or methyl, with the proviso that when Y and Z are taken together to form a ring and YZ is represented by the structure: $-(CH_2)_x-$, where n is 3 or 4, x is hydrogen;

Y and Z are each hydrogen, halogen, C_1–C_6 alkyl, hydroxyloweralkyl, C_1–C_6 alkoxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, nitro, cyano, C_1–C_4 alkylamino, diloweralkylamino or C_1–C_4 alkylsulfonyl group, or phenyl optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure: $-(CH_2)_n-$, where n is an integer of 3 or 4, provided that X is hydrogen; or



where L, M, Q and R_7 are each hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkyl, NO_2, CN, phenyl, phenoxy, amino, C_1–C_4 alkylamino, diloweralkylamino, chlorophenyl, methylphenyl, or phenoxy substituted with one Cl, CF_3, NO_2 or CH_3 group, with the proviso that only one of L, M, Q or R_7 may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy;

and the N-oxides thereof when W is O and A is CN, CH_3 or $COOR_3$, provided that in the N-oxides R_3 cannot be unsaturated alkyl and Y and Z cannot be alkylamino, dialkylamino or alkylthio; and when R_1 and R_2 represent different substituents, the optical isomers thereof, and, except when R_3 is a cation, the acid addition salts thereof.

4,798,620

BENZOXAZINES AND HERBICIDAL USE

Toyohiko Kume; Toshio Goto; Atsumi Kamochi, and Shigeki Yagi, all of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

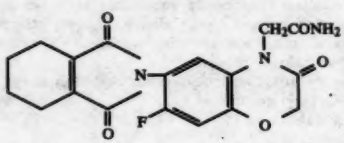
Continuation-in-part of Ser. No. 88,921, Aug. 24, 1987. This application Apr. 29, 1988, Ser. No. 187,713

Claims priority, application Japan, Sep. 6, 1986, 61-210725; May 9, 1987, 62-111696; Oct. 2, 1987, 62-27194; Feb. 2, 1988, 63-21359

Int. Cl.[4] A01N *43/84*; C07D *413/04*

U.S. Cl. 71—95 3 Claims

1. 2-[4-Carbamoylmethyl-7-fluoro-2H-1,4-benzoxazin-3-(4H)-3(4H)-on-6-yl]-4,5,6,7-tetrahydro-2H-isoindole-1,3-dione of the formula (I)



(I)

3. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of the compound according to claim 1.

4,798,621

SELECTIVE METHOD-OF-USE OF OXABICYCLOALKANES

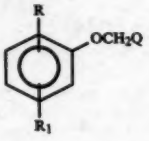
Robert C. Ackerson, Wilmington, Del., and Takeshi Yuyama, Toride, Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 918,163, Oct. 10, 1986, abandoned. This application Aug. 31, 1987, Ser. No. 90,056

Int. Cl.[4] A01N *43/10*; *43/16*

U.S. Cl. 71—90 16 Claims

1. The method for controlling the growth of undesired vegetation in a paddy rice crop which comprises applying to the locus of the paddy rice crop an effective amount of a compound of the formula:



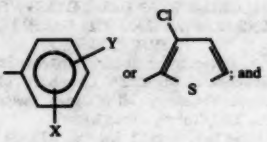
I

wherein

R is CH_3 or CH_2CH_3;

R_1 is CH_3, CH_2CH_3 or $CH(CH_3)_2$;

Q is



X and Y are independently H, F, Cl or CH_3.

4,798,622

PREPARATION OF FACETTED NODULAR PARTICLES

Bernard J. Pingaud, Vincennes, France, assignor to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/EP86/00052, § 371 Date Oct. 8, 1986, § 102(e) Date Oct. 8, 1986, PCT Pub. No. WO86/05026, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 1, 1986, Ser. No. 6,656

Claims priority, application France, Feb. 19, 1985, 85400284.7

Int. Cl.[4] C01G *49/06*

U.S. Cl. 75—0.5 AA 8 Claims

1. A process for preparing facetted, nodular particles having at least six faces, said process comprising (a) adding an aqueous solution of ferrous salt to an aqueous solution of alkaline hydroxide while avoiding substantial local excesses of the ferrous salt, and subjecting the ferrous salt solution to reducing conditions to reduce ferric ion contaminants present therein to ferrous ions, before or during the addition thereof to the alkaline hydroxide solution, to thereby form an aqueous dispersion of ferrous hydroxide particles, and (b) oxidizing the ferrous hydroxide particles, to thereby form delta ferric oxide hydrate particles, the oxidizing being in the presence of an iron complexing agent that is soluble in the reaction medium and capable of selectively forming ferric ion complexes that are soluble in such reaction medium.

4,798,623

METHOD FOR PRODUCING FINE COBALT METAL POWDER

Michael J. Cheresnowsky, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 19, 1988, Ser. No. 157,669

Int. Cl.[4] B22F *9/26*

U.S. Cl. 75—0.5 AA 4 Claims

1. A method for producing fine cobalt powder, said method comprising:

(a) adding to a solution of cobaltous chloride, sodium hydroxide in an amount equal at least to the stoichiometric amount required to form a precipitate of the major portion of the cobalt as cobaltous hydroxide and a mother liquor containing the balance of the starting cobalt;

(b) separating said precipitate from said mother liquor;

(c) water washing said precipitate to remove essentially all of the sodium therefrom; and

(d) reducing said precipitate to fine cobalt metal powder having a FSSS of from about 0.5 to about 2.0.

4,798,624

METHOD FOR THE MELT REDUCTION OF IRON ORES

Karl Brotzmann; Hans-Georg Fassbinder, both of Sulzbach-Rosenberg, Fed. Rep. of Germany, and Richard E. Turner, deceased, late of Applecross, Australia (by Trenna R. Turner, executor), assignors to Kloeckner CRA Technologie GmbH, Duisburg, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 23,369

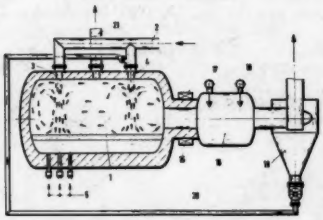
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607775

Int. Cl.[4] B23K *7/10*; C21B *13/00*

U.S. Cl. 75—38 17 Claims

1. A method for melt refining iron ore comprising reducing

and melting down the iron ore by introducing carbonaceous fuel into a first reaction zone and at a point beneath the surface of the melt, introducing an ore-free oxidizing gas in the form of a first afterburning gas jet from a first point above the surface of the melt and impinging upon the surface of the melt and introducing an oxidizing gas and at least a portion of the iron



ore in the form of a second afterburning gas jet from a second point above the surface of the melt which is spaced from the first point with the second jet impinging upon the surface of the melt at a location which is different from and further from the first reaction zone than the location at which the first jet impinges upon the surface of the melt.

4,798,625

SUPERALLOY WITH OXIDE DISPERSION HARDENING HAVING IMPROVED CORROSION RESISTANCE AND BASED ON NICKEL

Peter Jongenburger, Baden, and Robert Singer, Untersiggenthal, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Aug. 28, 1987, Ser. No. 90,346

Claims priority, application Switzerland, Sep. 8, 1986, 3593/86

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—235 **7 Claims**

1. A superalloy with oxide dispersion hardening having improved corrosion resistance and based on nickel, which consists essentially of:

Cr=17–18% by weight,
Al=6–7% by weight,
Mo=2–2.5% by weight,
W=3–3.5% by weight,
Ta=2–2.5% by weight,
Zr<0.2% by weight,
B<0.02% by weight,
C<0.1% by weight,
Y_2O_3=1–1.5% by weight,
Ni=remainder.

4,798,626

SOLUTIONS AND CREAMS FOR SILVER PLATING AND POLISHING

Lawrence M. Perovetz, Stanmore; Jack Pickthall, deceased, late of Angmering-On-Sea, and by Terence Pickthall, executor, Earls Colne NR Colchester, all of England, assignors to Lamerie, N.V., Jersey, Channel Islands

Filed Sep. 30, 1986, Ser. No. 913,491

Int. Cl.[4] C23C *3/02*

U.S. Cl. 106—123 **32 Claims**

1. A non-toxic solution for polishing and silver plating a base metal or for restoring silver removed from a silver plated article by previous polishing comprising: (1) a silver generating compound selected from the group consisting of silver nitrate, silver oxide, silver chloride, silver carbonate and silver phosphate; (2) a reducing compound for said silver generating compound which is selected from the group consisting of potassium hydrogen tartrate, sodium sulfite and sodium metabisulfate; (3) a polyoxyalkylene ester surfactant; (4) a humectant selected from the group consisting of diethylene glycol, dipropylene glycol and triethylene glycol; (5) a diatomaceous earth as a polishing component; (6) a compound to maintain the diatomaceous earth in suspension in the solution; (7) water.

4,798,627

DAMPENING AGENT FOR OFFSET PRINTING

Dieter Schmitt, Darmstadt, and Manfred Urban, Weiterstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 14, 1986, Ser. No. 918,245

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1985, 3536485

Int. Cl.[4] C09D *5/20*; B32B *9/00*

U.S. Cl. 106—2 **32 Claims**

1. In an aqueous dampening agent useful in offset printing and containing a humectant and a pH regulator, said dampening agent having a pH of about 3–6, the improvement wherein said agent includes an amount of copper ion which is anticorrosively effective.

4,798,628

SETTABLE MINERAL CLINKER COMPOSITIONS

Peter S. Mills, Burton-on-Trent, and Geoffrey R. Long, Kent, both of United Kingdom, assignors to Blue Circle Industries *PLC*, Aldermaston, Great Britain

Continuation of Ser. No. 792,746, Oct. 30, 1985, abandoned. This application Jul. 23, 1987, Ser. No. 77,021

Claims priority, application United Kingdom, Oct. 30, 1984, 8427456; May 20, 1985, 8512675

Int. Cl.[4] C04B *7/32*

U.S. Cl. 106—104 **10 Claims**

1. A mineral clinker composition containing $4CaO.3Al_2O_3.SO_3$, in an amount of from 15 to 68%, and not more than 45.6% of $2CaO.Al_2O_3.SiO_2$, the balance, if any, of the composition being composed essentially of at least one component selected from the group consisting of not more than 1.0% of free lime, less than 25% of $CaO.2Al_2O_3$, not more than 10% of $12CaO.7Al_2O_3$, less than 5% of $CaO.TiO_2$, less than 10% of ferrite phase, up to 60% of $CaO.Al_2O_3$, and up to 4.1% of $CaSO_4$; the said percentages being by weight of the mineral clinker composition.

4,798,629

SPIN-ON GLASS FOR USE IN SEMICONDUCTOR PROCESSING

Thomas E. Wood, Chandler, and Henry G. Hughes, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 22, 1987, Ser. No. 111,316

Int. Cl.[4] C09K *3/00*

U.S. Cl. 106—287.16 **20 Claims**

1. A spin-on glass for use in processing semiconductor devices, said spin-on glass comprising:

a first compound of tetraethoxysilane, methyltriethoxysilane, and dimethyldiethoxysilane combined in a 2/1/1 ratio;
ethanol;
hydrochloric acid; and
water.

4,798,630

PROCESS FOR SURFACE TREATING CLAY MINERALS AND REACTIVE INTERMEDIATES PRODUCED BY SAID PROCESS

Weyman H. Dunaway, and Jorge E. Salinas, both of Sandersville, Ga., assignors to E.C.C. America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 493,357, May 10, 1983, abandoned. This application Jun. 17, 1986, Ser. No. 875,273

Int. Cl.[4] C09K 3/00

U.S. Cl. 106—287.1 10 Claims

1. A method for chlorinating and functionalizing an aluminosilicate clay mineral starting composition, comprising:

reacting a said clay mineral composition selected from one or more members of the group consisting of clays of the halloysite, illite, kaolinite, montmorillonite, and polygorskite groups in substantially dry particulate form with gaseous $SiCl_4$ to activate the surface of said composition, thereby forming a reactive chloride intermediate, said reaction being conducted at temperatures in the range of from about 56° C. to below 300° C.; maintaining said intermediate in a substantially dry state until used for further reaction; and thereafter functionalizing said intermediate with an active organic group.

4,798,631

METALLIC SEMI-FINISHED PRODUCT, PROCESSES FOR ITS PREPARATION AND ITS USE

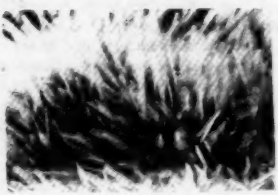
Hans-Joachim Fleischer, Velbert; Klaus Lohscheidt, Krefeld; Dieter Görres, Haan, and Friedrich Behr, Essen, all of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft vorm August Thyssen-Hutte, Duisburg, Fed. Rep. of Germany

Filed Feb. 25, 1987, Ser. No. 18,545

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1986, 3606804

Int. Cl.[4] C21D 9/00

U.S. Cl. 148—3 13 Claims



1. A process for the preparation of a metallic semi-finished product based on iron and/or nickel and/or cobalt and containing 2 to 16% of aluminum, 12 to 30% of chromium and 0.01 to 4% of at least one highly reactive element from the group consisting of Y, Zr, Ti, Ce, Sm, Hf, La, Th, U, V, W, Ta, Nb. Mo. Gd, Si, Mg, Ca and/or their dispersed oxides, and normal steelmaking impurities, containing metallic columnar cystals formed at least in the surface region of the semi-finished product and columnar crystals consisting predominantly of aluminum oxide and/or chromium oxide growing out of the said metallic columnar crystals, the axes of the two types of columnar crystals being predominantly at right angles to the geometric surface of the semi-finished product, comprising solidifying a melt of the corresponding composition in a front predominantly parallel to the geometric surface at a cooling rate of 10^3 to 10^6 K/s, and then annealing, initially at a temperature of 800° to 1000° C. for a short time in CO_2 under the resulting reducing conditions, and then in the temperature range from 800° to 1000° C. for up to 25 hours in air.

4,798,632

NI-BASED ALLOY AND METHOD FOR PREPARING SAME

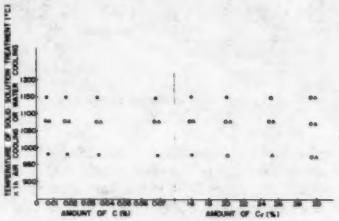
Toshio Yonezawa, Takasago; Noritake Yamaguchi, Kobe, and Yasutaka Okada, Amagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 4,410

Claims priority, application Japan, Jan. 20, 1986, 61-9491; Jan. 20, 1986, 61-9492; Jan. 20, 1986, 61-9493; Jan. 20, 1986, 61-9494

Int. Cl.[4] C22F 1/10

U.S. Cl. 148—12.7 N 19 Claims



15. A method for preparing a high-strength Ni-based alloy excellent in resistance to stress corrosion cracking in high-temperature high-pressure pure water, principally characterized by subjecting, to a hot working at 850 to 1,250° C. at a draft percentage of 20% or more, said alloy consisting essentially of, in terms of weight ratio, 0.08% or less of C, 0.15% or less of Si, 0.1 to 1% of Mn, 15% or less of Fe, 20 to 30% of Cr, 0.76–3.5% of Ti, 2% or less of Al, 7% or less of Nb and the balance of Ni; heating and maintaining said alloy at 980° to 1,200° C.; cooling said alloy; and subjecting said alloy once or more to an aging treatment of additionally heating and maintaining it at 550° to 850° C. whereby said alloy has at least one of a γ' phase and γ'' phase in a base and semicontinuously predominantly precipitating $M_{23}C_6$ in grain boundaries.

4,798,633

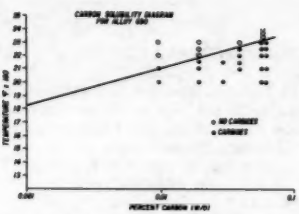
NICKEL-BASE ALLOY HEAT TREATMENT

James M. Martin, Proctorville, Ohio; James R. Crum, Ona, W. Va.; William L. Mankins, and Jeffrey M. Sarver, both of Huntington, W. Va., assignors to INCO Alloys International, Inc., Huntington, W. Va.

Filed Sep. 25, 1986, Ser. No. 911,474

Int. Cl.[4] C22F 1/10

U.S. Cl. 148—162 10 Claims



1. A process of heat treating nickel-base tubing characterized by good resistance to stress-corrosion cracking in high purity water nuclear reactor environments, including deaerated caustic solutions such as can be found in PWR secondary water environments, notwithstanding that it is given only a short duration thermal heat treatment, which comprises subjecting tubing formed from an alloy consisting essentially of

about 28 to 32% chromium, about 6 to 13% iron, up to 0.06% carbon, up to about 0.5% each of silicon, manganese and copper and the balance essentially nickel, to treatment in a continuous annealing furnace within the temperature range of about 1750° to 2150° F. for about ¼ to 1 hour, and thereafter subjecting the tubing to a thermal treatment over the range of about 1300° to 1700° F. for a period of time at least sufficient to precipitate carbides at the grain boundaries, the period not exceeding about 2 hours.

4,798,634

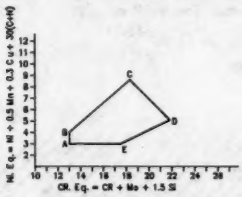
CORROSION RESISTANT WROUGHT STAINLESS STEEL ALLOYS HAVING INTERMEDIATE STRENGTH AND GOOD MACHINABILITY

Harry E. McCune, III, and Charles A. Divine, Jr., both of Fredonia, N.Y., assignors to Al Tech Specialty Steel Corporation, Dunkirk, N.Y.

Continuation of Ser. No. 827,969, Feb. 10, 1986, abandoned. This application Aug. 10, 1987, Ser. No. 84,321

Int. Cl.[4] C22C *38/40*

U.S. Cl. 148—325 **13 Claims**



1. A wrought martensitic-ferritic stainless steel alloy consisting essentially of maximum elemental weight percentages of about 0.08C, 0.08N, 2.0Mn, 0.06P, 1.0Si, 2.5Mo, 4.0Cu, 0.10Al, 0.10Ta, 0.10Ti, 0.10Cb with the sum of said Cb, Al, Ta and Ti being at most about 0.15 weight percent, about 0.1 to 0.6 weight percent S, about 16.0 to 20.0 weight percent Cr, about 3.0 to 7.0 weight percent Ni, the remainder being Fe and including at least about 10 vol. % ferrite, said stainless steel alloy having good hot workability, good machinability, corrosion resistance superior to a S41600 stainless steel alloy and intermediate tensile strength.

4,798,635

FERRITIC-AUSTENITIC STAINLESS STEEL

Sven-Olov Bernhardsson; Hans F. Eriksson, both of Sandviken; Sven P. Norberg, Gävle; Lars O. H. Forssell, and Nils R. Lindqvist, both of Sandviken, all of Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Filed Apr. 1, 1985, Ser. No. 718,291

Claims priority, application Sweden, Mar. 30, 1984, 8401768; May 9, 1984, 8401768

Int. Cl.[4] C22C *38/20, 38/22*

U.S. Cl. 148—325 **25 Claims**

1. Ferritic-austenitic steel alloy having high resistance to corrosion and good weldability, the austenite phase of which beign stable towards cold deformation in the range between 10 and 30% said steel consisting essentially of the following elements by weight:

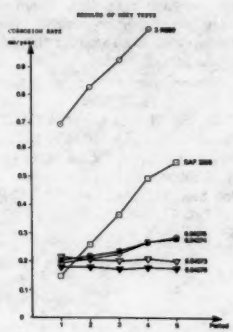
C, a maximum of 0.06%
Si, 1.5%
Mn, 2.0%
Cr, from 21.5% to 24.5%
Ni, from 2.5% to 5.5%
Mo, from 0.01% to 1.0%
Cu, from 0.01% to 1.0%
N, from 0.05% to 0.3%

the remainder of said composition iron and normal impurities, the contents of said elements being balanced so that following conditions are fulfilled:

ferrite content, α, is between 35% and 65%

percentage of ferrite $\% \alpha \leq 0.20 \times (\% Cr / \% N) + 23$ to obtain good properties after welding

(% Cr+% Mn)/% N shall be >120 to avoid porosities during casting



22.4×% Cr+30×% Mn+22×% Mo+26×% Cu+110×% N>540 to maintain austenite stability,

% Mo+% Cu≧0.15 whereby % Cu shall be at least 0.05%, and

precipitated carbides and nitrides are essentially avoided.

4,798,636

COMPOSITE SOLID PROPELLANT

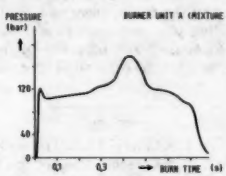
Ruediger Strecker, Waldkraiburg, Fed. Rep. of Germany, assignor to Bayern-Chemie Gesellschaft fuer flung-chemische Antriebe mbH, Aschau, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 152,311

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704305

Int. Cl.[4] C21D *1/568*

U.S. Cl. 149—19.9 **7 Claims**



1. A composite solid propellant, comprising: an oxidizer, a hardenable binder selected from the group consisting of telomeric polybutadiene, polymers of butadiene and acrylonitrile having functional groups located at polymer chain terminal positions or statistically distributed along the polymer chains, polyethers, and polyesters; a burn moderator comprising a metallic compound having a melting temperature not less than 2400° C. and including soot; and additives including softeners and burn catalysts; said metallic compound of said burn moderator being selected from the group consisting of a nitride, a carbonitride, and a boride of zirconium, titanium, tungsten, hafnium, tantalum, and niobium.

4,798,637

COMPOSITE SOLID PROPELLANTS CONTAINING BITETRAZOLES

Roger R. Hendrickson, Bear River City, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Mar. 3, 1983, Ser. No. 471,618
Int. Cl.[4] C06B 45/08
U.S. Cl. 149—20 4 Claims

1. In a composite solid propellant containing ammonium perchlorate as oxidizer, the improvement comprising at least one bitetrazole compound in an amount effective to reduce the burning rate of said propellant.

4,798,638

METHOD FOR HEAT SEALING A FACING SHEET ONTO A PLASTIC FOAM SHELL

Philip J. Marbach, Doylestown, Pa., assignor to Personal Products Company, Milltown, N.J.

Filed Aug. 15, 1986, Ser. No. 897,172
Int. Cl.[4] B65B 7/00, 7/16
U.S. Cl. 156—69 4 Claims

1. A method for attaching a porous facing sheet onto a non-planar surface of a plastic foam sheet, comprising:

(a) providing formed plastic foam shells integrally attached to a foam sheet, each said shell having a central cavity depth of at least about 0.5 inch and a downwardly curved non-planar upper surface;

(b) applying a porous facing sheet onto the curved non-planar surface of the formed foam shell by intermittently slitting the facing sheet at spaced intervals transverse to the sheet length and intermediate the formed shells;

(c) moving the shell and facing sheet together near a heating and sealing unit having a heating plug member, and contacting the combined facing sheet and adjoining foam shell with the heating unit and forcing at least a portion of said facing sheet downwardly into contact with the downwardly curved non-planar upper surface of the shell; and

(d) rapidly heating the facing sheet and shell upper surface with the heating plug member at the softening temperature of the foam shell and heat sealing the facing sheet onto the perimeter of the foam shell upper surface, so as to provide a covered flexible shell product.

4,798,639

METHOD OF LAMINATING PLASTIC RESIN SHEETS

Akira Yamaguchi, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 14, 1988, Ser. No. 168,014
Claims priority, application Japan, Mar. 16, 1987, 62-059034
Int. Cl.[4] B29C 27/08
U.S. Cl. 156—73.1 6 Claims

4. A method of laminating three or more thermoplastic resin sheets successively by sonic bonding comprising;

(1) superposing a first thermoplastic resin sheet on a second thermoplastic resin sheet, at least one of said thermoplastic resin sheets having an embossed surface facing the other thermoplastic resin sheet,

(2) pressing an ultrasonic horn having a pressure face having projections onto said first thermoplastic resin sheet to bond it to the second thermoplastic resin sheet and to provide the pressed surface of the first thermoplastic resin sheet with recesses and projections,

(3) superposing a third thermoplastic resin sheet of which both surfaces are flat onto said pressed surface of the first thermoplastic resin sheet, and

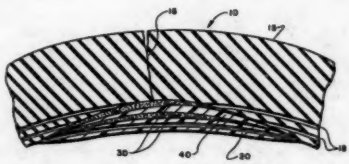
(4) pressing an ultrasonic horn onto said third thermoplastic resin sheet to bond it to the first thermoplastic resin sheet whereby ultrasonic energy is concentrated in the projections of the pressed surface of the first thermoplastic resin sheet.

4,798,640

TIRE REPAIR BY "PATCH ONLY" METHOD

Russell W. Koch, Hartville, Ohio, and Douglas D. Snyder, Tempe, Ariz., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 913,421, Sep. 30, 1986, Pat. No. 4,732,196, which is a continuation of Ser. No. 767,998, Aug. 21, 1985, abandoned, which is a continuation of Ser. No. 584,426, Feb. 28, 1984, abandoned. This application Dec. 14, 1987, Ser. No. 133,097
Int. Cl.[4] B32B 35/00; B60C 21/02
U.S. Cl. 156—95 18 Claims



1. A process for repairing a cured reinforced elastomer article having crack therethrough comprising the steps of:

applying a treating agent to a patch area, said patch area located on the interior side of the article and in the vicinity of said crack, said elastomer having unsaturated groups therein, said treating agent selected from the group consisting of N-halohydantoins, N-haloamides, N-haloimides and combinations thereof;

applying an amine curable polymer or prepolymer system to said patch area;

and applying a patch to said patch area; and

curing said amine curable polymer or prepolymer at ambient temperature.

4,798,641

METHOD OF FABRICATING A CABLE

Michael R. Murr, Hopewell Township, Mercer County; Jay R. Rajasekera, Mercer County, both of N.J., and Bruce C. Vrieland, Norcross, Ga., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,288
Int. Cl.[4] B65H 69/06
U.S. Cl. 156—158 9 Claims

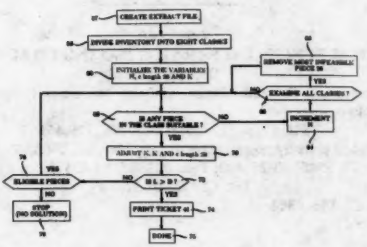
1. A method for fabricating a transmission media, comprising the steps of:

selecting a plurality of pieces of transmission media from an inventory containing pieces having different lengths, different loss per unit length and different variation in loss; and

joining the selected pieces end-to-end, characterized in that said pieces are selected so that the median loss per unit length of the pieces remaining in inventory after selection remains substantially the same after selection, said selecting step including the steps of:

(a) establishing different classes of pieces within the inventory based on whether:

(1) each piece is longer or shorter than the average length of the pieces in the inventory;
(2) each piece has a loss per unit length above or below a desired loss per unit length of the transmission media to be fabricated; and
(3) each piece has a variation in loss above or below a predetermined value;



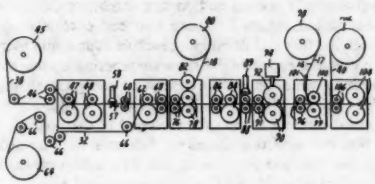
(b) successively examining each class to determine if any of the pieces therein are suitable for fabricating the transmission media based on the characteristics of said any piece and of those previously selected pieces; and
(c) repeating the step of successively examining the classes until the cumulative length of the pieces selected is at least equal to the desired length of the transmission media to be fabricated.

4,798,642

METHOD OF MAKING A BIOMEDICAL ELECTRODE

Lawrence W. Craighead, and Clarence A. Niven, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 865,520, May 21, 1986, Pat. No. 4,727,881, which is a continuation of Ser. No. 551,068, Nov. 14, 1983, abandoned. This application Nov. 17, 1987, Ser. No. 121,538
Int. Cl.[4] A61B *5/04;* B32B *31/18*
U.S. Cl. 156—252 **6 Claims**



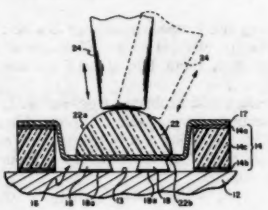
1. A method of manufacturing biomedical electrodes comprising the steps of:
a. cutting apertures at predetermined locations along the length of a first release liner;
b. laminating a medical tape comprising a backing having a pressure-sensitive adhesive coating on at least one major surface thereof to the release liner whereby the adhesive-coated surface of said tape is adhered to the release liner;
c. cutting said medical tape transversely between each of said apertures;
d. laminating a series of retainer sheets having upper and lower major surfaces bound together by an edge surface to said medical tape through each of said apertures in said first release liner whereby said retainer sheets are adhered through said apertures to said adhesive-coated surface of said tape;
e. cutting an aperture through said retainer sheets and on through said medical tape;
f. locating an electrical terminal member comprising a base having upper and lower major surfaces and an upstanding post integral with said upper major surface of said base in each aperture in each retainer sheet and in the medical tape by extending said post of said terminal member through said aperture until said upper major surface of said base contacts the lower surface of said retainer sheet;
g. laminating an ionically conductive layer to the lower surface of said each base and the lower surface of each retainer sheet through said apertures in said first release liner;
h. laminating a second release liner to said conductive layers opposite said base and said retainer sheets;
i. laminating a protective sheet, comprising a pressure-sensitive adhesive adhered to a backing, to said first release liner opposite said medical tape and to said second release liners opposite said conductive layers whereby each of said second release liners is secured to said first release liner; and
j. cutting said first release liner and said protective sheet transversely at predetermined locations along the length of said first release liner and protective sheet to form a strip containing a multiplicity of electrodes thereon.

4,798,643

SELF-ALIGNING BONDING TECHNIQUE

Dino E. Argentini, Danvers, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 8, 1985, Ser. No. 721,243
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—295 **7 Claims**



1. A method for providing a uniform bond between a pair of members with a first member disposed over the second member includes the steps of:
providing a plano-convex member having a plane surface over an upper portion of the second member with the plane surface of the member disposed adjacent the upper portion of the second member; and
applying a force to a portion of the member opposite to the plane portion of the member to provide a substantially uniformly distributed pressure to the plane portion of the member.

4,798,644

METHOD OF MAKING A CARPET

Richard L. Scott, Cohutta, Ga.; John J. Martin, Hixson, Tenn., and Landon Smith, Roosville, Ga., assignors to Polysar Financial Services, S.A., Fribourg, Switzerland

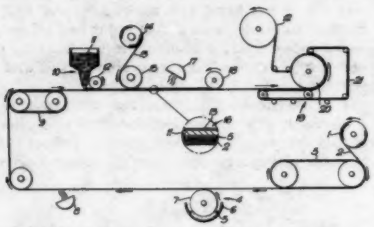
Filed Mar. 24, 1988, Ser. No. 172,437
Int. Cl.[4] B32B *31/12, 31/20*
U.S. Cl. 156—324 **11 Claims**

1. A process for producing a laminate foam backed carpet which comprises adhering over a foam backing a non-woven scrim material having a cohesive strength less than the cohesive strength of said foam backing, said process comprising:
(a) applying from about 30 to about 70 ounces per square

yard of a foamed latex compound to a pre-coated carpet, said foamed compound comprising per 100 parts by weight of one or more rubbery polymers selected from the group consisting of:

(i) polymers comprising: from about 20 to about 80 parts by weight of a C_8–C_{12} vinyl aromatic monomer which is unsubstituted or substituted by a C_1–C_4 alkyl radical or a chlorine or bromine atom and from about 20 to about 80 parts by weight of a C_4–C_6 conjugated diolefin which is unsubstituted or substituted by a chlorine atom; and

(ii) polymers comprising co or homo polymers of C_{4-6} conjugated diolefins which are unsubstituted or substituted by a chlorine atom and up to about 200 parts by weight of at least one filler selected from the group



consisting of calcium carbonate, glass microspheres, dolomite, talc, barytes, clay and aluminum trihydrate, a gelling system and a cure paste;

(b) applying said non-woven scrim material over said foamed compound thus forming a laminate carpet material,

(c) subjecting said foamed compound to a heat treatment to a temperature of from about 70° to about 85° C. for a period of from about 1 to about 5 minutes to gell said foam;

(d) compressing said laminate carpet material;

(e) vulcanizing and drying said compressed laminate carpet material by subjecting it to a temperature of from about 100° to about 150° C. for a period of from about 10 to about 30 minutes.

4,798,645

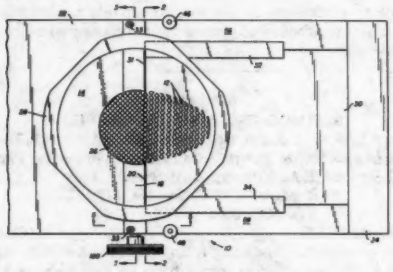
WAFER SEGMENT SEPARATOR AND METHOD

Chong-Il Pak, 3610 Bassett St. #5, Santa Clara, Calif. 95050

Continuation of Ser. No. 896,655, Aug. 13, 1986, Pat. No. 4,702,365, which is a continuation-in-part of Ser. No. 649,080, Sep. 10, 1984, Pat. No. 4,607,744. This application Oct. 26, 1987, Ser. No. 113,009

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—344 **6 Claims**



3. In a method of separating integrated circuit chips from a flexible carrier to which the chips are adhesively attached, the steps of: positioning the carrier with the integrated circuit chips attached thereto on a supporting surface having a separator edge extending along one side thereof, drawing the carrier across the separator edge to separate the integrated circuit chips from the carrier, receiving the chips on a conveyor as they are separated from the carrier, and advancing the conveyor to carry the separated chips away from the separator edge.

4,798,646

FILM PEELING APPARATUS HAVING FILM END DETECTOR

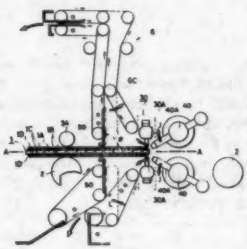
Shigeo Sumi, Saitama, Japan, assignor to Somar Corporation, Tokyo, Japan

Filed Nov. 12, 1986, Ser. No. 929,463

Claims priority, application Japan, Nov. 12, 1985, 60-253434; Nov. 27, 1985, 60-266490; Feb. 5, 1986, 61-23179

Int. Cl.[4] B32B *31/16*

U.S. Cl. 156—364 **6 Claims**



1. A film peeling apparatus for peeling and discharging a film adhered to a board comprising:

(a) conveying means for carrying the board through the apparatus;

(b) film lifting means for initially separating the film to be peeled from a bonding surface of the board, said film lifting means being comprised of a projected press mechanism having a cylindrical needle-like press member with a substantially conical end portion extending therefrom and mechanical means for bring said end portion in contact with the film and its bonding surface at an angle therewith to create a gap at an interface therebetween whereby said lifting means applies film separating energy to an interface between the film and the bonding surface up to a predetermined distance from a forward end of the board;

(c) film end detecting means for detecting the forward edge of the film and positioning said film lifting means at the forward edge of said film to separate said film;

(d) film peeling means for raising the film from its surface after the film has been initially separated therefrom by said film lifting means; and

(e) film discharging means for receiving the film from said film peeling means and discarding the film.

4,798,647

RELEASABLE MOUNTING ASSEMBLY FOR TIRE BUILDING DRUM

Herbert G. Haas, 1650 Perry Dr., Canton, Ohio 44708

Filed Jan. 25, 1988, Ser. No. 148,292

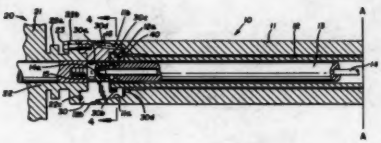
Int. Cl.[4] B29D *30/24*

U.S. Cl. 156—414 **18 Claims**

1. A mounting assembly for a tire building drum, said drum having a mounting hub on at least one axial end for attachment to a drum driving shaft of a tire building machine, said assembly comprising:

(a) a tapered plug attachable to a projecting end of the mounting hub;

(b) a chuck secured to the hub and disposed interiorly of said tapered plug; and



(c) attachment means for releasably interconnecting said chuck to the drum driving shaft.

4,798,648

ARTICLE FEEDING DEVICES FOR LABELLERS

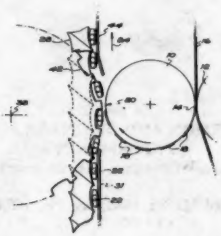
Michael Freeman, Clacton-On-Sea, England, assignor to John Waddington PLC, England

Filed Mar. 13, 1987, Ser. No. 25,411

Claims priority, application United Kingdom, Mar. 18, 1986, 8606628

Int. Cl.[4] B65C 9/02

U.S. Cl. 156—542 3 Claims



1. In an article labelling machine comprising:

(a) a feed scroll arranged with its axis horizontal for feeding articles held between the flights in the direction of the feed scroll axis and in fixed pitched relationship;

(b) guide means for holding the articles between the feed scroll flights;

(c) a label applicator drum arranged with its axis vertical;

(d) a star wheel having pockets which are pitched similar to the pitching of the flights of the scroll, said star wheel being arranged with its axis vertical and cooperating with the applicator drum so that labels can be applied to the articles from the drum whilst the articles are held in the star wheel pockets, the improvement comprising that the scroll overlaps the star wheel so as to cooperate intimately therewith; lies slightly within and parallel to the tangent of the star wheel relative to the applicator drum; and extends to opposite sides of the star wheel, and the guide means are at opposite sides of the star wheel whereby the scroll, star wheel and guide means keep a holding control on the articles to maintain the pitching thereof as the articles move towards, into and out of the star wheel pockets.

4,798,649

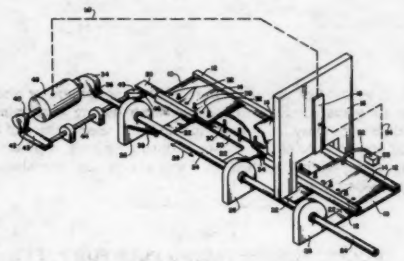
DISCRETE STRIP TAPER

John P. Ross, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 463,790, Feb. 4, 1983, abandoned. This application Dec. 28, 1984, Ser. No. 685,609

Int. Cl.[4] B32B 31/00

U.S. Cl. 156—552 6 Claims



1. Apparatus for applying a securing tape to a lead frame having longitudinal locator hole rows arrayed along the edges thereof, said apparatus comprising:

a feeding means for advancing discrete pieces of lead frame into a tape-applying portion of said apparatus;

taping means located at said tape-applying portion for applying securing tape elements to said lead frame;

a guide and support surface adapted to accept said discrete pieces of lead frame thereon for sliding support, said lead frame pieces being guided thereby into position in the tape applying portion said guide and support surface including a plurality of slots located in registry with the locator holes associated in the lead frame being transported;

pin means comprising a plurality of pins adapted to extend through said slots and enter said locator holes in said lead frame pieces, said pins being substantially smaller than the locator holes they enter, so as to maintain a clearance between the pins and the locator holes;

pin support means holding said pins at spacings corresponding to the spacings of every other hole in the lead frame pieces; and

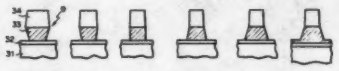
means for moving said pin support means so that said pins can be moved into and out of the plane of said lead frame pieces and so that said pins can be translated along the direction of said locator hole rows;

actuating means connected to move said pin support means, and thus said pin means, first into the holes in the lead frame pieces, then along said guide and support surface a distance equal to the sum of the spacing between the holes in the lead frame pieces and the clearance between the pins and the edges of the holes, so as to move the lead frame pieces toward the tape applying portion, then in the reverse direction along said guide a distance substantially equal to the clearance between the holes and the pins therein, thereby to establish clearance between the lead frame holes and the pins, then out of the holes in the lead frame pieces, and then in the reverse direction a distance equal to the spacing of the holes so as to be in a position to reenter the holes, upon repeat of the movement cycle, without contacting the edges of the holes.

4,798,650
METHOD OF DRY ETCHING ALUMINUM

Moritaka Nakamura, Yokohama, and Takashi Kurimoto, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 28, 1988, Ser. No. 174,348
Claims priority, application Japan, Mar. 27, 1987, 62-071737
Int. Cl.[4] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 5 Claims



1. A method of reactive ion etching of aluminum or aluminum alloy characterized in that a substrate having an aluminum or aluminum alloy layer is maintained at a temperature of 60° C. or less by cooling the substrate during etching, so that said layer is taperingly etched to form conductor lines having sloped sidewalls.

4,798,651
PROCESS FOR PREPARING PULP FOR PAPER MAKING

Bohuslav Kokta, Three Rivers, Canada, assignor to Stake Technology Ltd., Oakville, Canada

Filed Jul. 31, 1987, Ser. No. 79,928
Claims priority, application Canada, Mar. 24, 1987, 523871
Int. Cl.[4] D21B 1/36; D21C 3/00, 3/04
U.S. Cl. 162—22 23 Claims

1. A process for making paper making pulp comprising the step of:

(1) thoroughly impregnating wood fragments having fibers suitable for paper making in the substantial absence of air with an alkaline aqueous liquor including at least one agent acting to provide hydrophilic groups and as an antioxidant to impregnate enough of said agent throughout the wood fragments to protect the wood fragments from acidic hydrolysis and oxidative degradation during subsequent cooking;

(2) steam cooking the impregnated chips in direct contact with saturated steam in the substantial absence of air at superatmospheric pressure and a temperature within the range of about 170° C. to 210° C.;

(3) subjecting the wood fragments to explosive decompression to give wood fragments that are softened and partially defibrated;

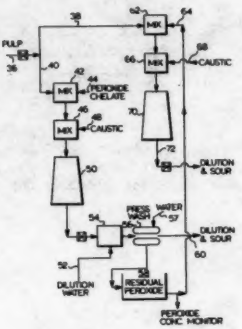
(4) without undue delay that would result in brightness loss, refining the softened and defibrated chips to provide pulp.

4,798,652
PEROXIDE BLEACHING OF MECHANICAL PULPS

Peter Joyce, 5344-6th Avenue, South Delta, British Columbia, Canada V4M 1L5, and David M. Mackie, 686 Crystal Court, North Vancouver, British Columbia, Canada V7R 2B5

Filed Oct. 19, 1987, Ser. No. 110,179
Int. Cl.[4] D21C 3/00
U.S. Cl. 162—60 19 Claims

1. A process for peroxide bleaching of mechanical pulp comprising washing a first and second pulp to reduce the amount of heavy metal ions in said first and second pulp to provide a first and second washed pulp, mixing peroxide in an amount of the equivalent of at least 1½% peroxide as hydrogen peroxide based on the oven dry weight of said pulp with said first washed pulp to disperse said peroxide uniformly throughout said first washed pulp while maintaining the pH of said peroxide less than 7 to form a mixture of said first pulp and said peroxide mixing an aqueous solution of caustic with said mixture of said first pulp and said peroxide to uniformly mix said caustic into said mixture, said caustic being present in an amount of at least 50% by weight of the amount of peroxide added based on NaOH as the caustic, reacting said caustic with said peroxide to produce perhydroxyl ions in situ in said first pulp and reacting said perhydroxyl ions with said first pulp to provide a brightened first pulp brightened to the desired degree substantially solely by said perhydroxyl ions produced in



situ in said first pulp and a residual liquor containing bleaching chemical equivalent to at least 35% of said peroxide added, separating said residual liquor from said brightened first pulp and utilizing said separated residual liquor to brighten said second pulp to the desired degree.

4,798,653
RETENTION AND DRAINAGE AID FOR PAPERMAKING

John D. Rushmere, Wilmington, Del., assignor to Procomp, Inc., Marietta, Ga.

Filed Mar. 8, 1988, Ser. No. 165,634
Int. Cl.[4] D21H 3/58, 3/78
U.S. Cl. 162—168.3 10 Claims

1. In a papermaking stock including cellulose fibers in a concentration of at least about 50% by weight of such fibers in an aqueous medium the improvement comprising:

a cationic component comprising a colloidal silica sol compound selected from the group consisting of colloidal silicic acid sol, colloidal silicic acid sol modified with at least one surface layer of aluminum atoms,

an anionic component selected from the group consisting of polyacrylamide prepared by the hydrolysis of polyacrylamide, polyacrylamide prepared by the copolymerization of acrylic acid with acrylamide, and polyacrylamide derived from the copolymerization of acrylamide with methacrylamide,

said cationic component being present in the stock in a concentration between about 0.01 to about 2.0 weight percent based on the solids content of the stock,

said anionic component being present in said stock at a concentration from about 0.01 to about 1.0 weight percent based on the solids content of the stock,

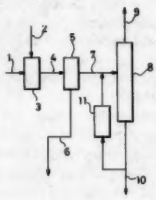
whereby said stock is rendered effectively resistant to destruction of its retention and dewatering properties by shear forces incurred by said stock in the course of forming of the stock into a paper web.

4,798,654

PROCESS FOR PREPARING BISPHENOL A

Shigeru Iimuro; Takashi Kitamura, both of Nagoya, and Yoshio Morimoto, Tokai, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,181
Claims priority, application Japan, May 6, 1987, 62-108964
Int. Cl.[4] B01D 3/10; C07C 37/74
U.S. Cl. 203—94 9 Claims



1. A process for preparing 2,2-bis(4-hydroxyphenyl)propane comprising:

(a) feeding an adduct of 2,2-bis(4-hydroxyphenyl)propane and phenol to a distillation column a;

(b) distilling the adduct and removing phenol from the top of the distillation column and a stream containing 2,2-bis(4-hydroxyphenyl)propane from the bottom of the distillation column; and

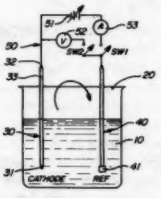
(c) recycling a portion of the stream containing 2,2-bis(4-hydroxyphenyl)propane removed from the bottom of the distillation column and combining said portion with the adduct being fed to the distillation column.

4,798,655

MULTIPARAMETER ANALYTICAL ELECTRODE STRUCTURE AND METHOD OF MEASUREMENT

Howard Diamond, 121 Huronview Blvd., Ann Arbor, Mich. 48103

Filed Mar. 19, 1987, Ser. No. 27,846
Int. Cl.[4] G01N 27/46, 27/48, 27/50
U.S. Cl. 204—1 T 16 Claims



1. The electrochemical method of simultaneously or sequentially measuring in a liquid both a dissolved ionic species and a dissolved gas including the steps of:

(a) providing a single polarographically active working electrode having an electrochemically active, base metal/-metal oxide surface having the property of providing a stable electrochemical potential that is a quantitative measure of said ionic species and acting as a catalyst for electron transfer allowing for a quantitative polarographic or amperometric measure of said dissolved gas;

(b) providing a reference electrode;

(c) measuring the open circuit voltage generated by the electrode pair;

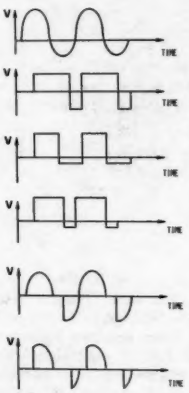
(d) measuring the closed circuit current flow either in driven mode or in self-generated mode, and comparing said voltage and current values with predetermined voltage and current reference standards to provide multiple values of parameters representative of concentrations of said ionic species and dissolved gas.

4,798,656

PROCESS FOR ELECTROLYTICALLY DYEING AN ANODIC OXIDE LAYER ON ALUMINUM OR ALUMINUM ALLOYS

Jean-Francois Paulet, Sibiingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 12, 1988, Ser. No. 142,945
Claims priority, application Switzerland, Jan. 16, 1987, 145/87
Int. Cl.[4] C25D 5/50
U.S. Cl. 204—37.6 11 Claims



1. A process for electrolytically dyeing an anodic oxide layer on aluminum or aluminum alloys by means of direct or alternating current in an electrolyte containing at least one metal salt comprising pretreating the oxide layer prior to dyeing by means of asymmetric alternating current.

4,798,657

CATHODIC PROTECTION SYSTEM

Richard J. Kochilla, Cleveland, and Otto J. Esterle, Medina, both of Ohio, assignors to Corrpro Companies, Inc., Medina, Ohio

Filed Jan. 20, 1987, Ser. No. 4,901
Int. Cl.[4] C23F 13/00
U.S. Cl. 204—147 9 Claims

1. A protection apparatus adapted to limit the corrosive effects of a liquid stored in a metallic tank, said apparatus comprising:

a cylindrical tank having a sidewall;

a plurality of elastic support members extending generally radially inwardly from the sidewall;

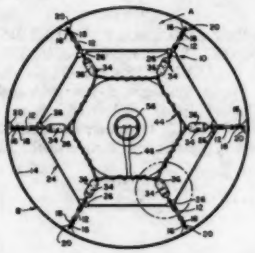
a first hoop structure peripherally supported at selected portions and joined with the sidewall by the support members;

a second hoop structure disposed radially inward from the first hoop structure and generally below the first hoop structure in generally concentric relation therewith;

anode means operatively associated with the second hoop structure to carry an impressed current and produce an electrolytic effect countering the corrosive effects of the liquid; and,

anode level compensator means positioned above the second hoop structure, the anode level compensator means hav-

ing generally neutral buoyancy when completely submerged in the liquid and including a plurality of hollow members with apertures through which liquid flows for



varying the apparent weight of the compensator means as the liquid level in the tank changes whereby the anode means remains submerged in the liquid.

4,798,658

DEVICE FOR THE CATHODIC CORROSION-PROTECTION OF METAL PARTS

Reinhold Herzog, Graz; Reinhard Padinger, St. Johann o.H.; Hans-Peter Rainer, Graz, and Helmo Schober, St. Radegund, all of Austria, assignors to D 3 Cathodic Products-Korrosionsschutzprodukte Gesellschaft m.b.H., Austria

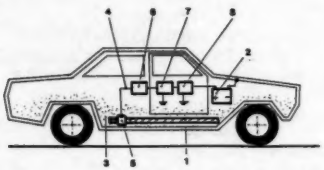
PCT No. PCT/AT86/00048, § 371 Date Apr. 24, 1987, § 102(e) Date Apr. 24, 1987, PCT Pub. No. WO87/00558, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 14, 1986, Ser. No. 37,352

Claims priority, application Austria, Jul. 12, 1985, 2063/85

Int. Cl.[4] C13F *13/00*

U.S. Cl. 204—147 **23 Claims**



1. Device for the cathodic corrosion-protection of metal parts, in which a potential difference is generated between the metal parts to be protected and any electrolyte located on the metal part, so that at places to be protected on the metal surface a direct current enters from the electrolyte into the metal surface, which counteracts the migration of positive metal ions from the metal surface, wherein for the protection of the surface of metal parts not buried in the ground, said device comprises means for applying an essentially constant potential difference between the electrolyte and the metal surface over large areas of said metal surface, comprising an electrode and at least one voltage source, the electrode coming into electrical connection with the electrolyte being applied linearly and/or superficially over wide regions of the surface to be protected.

4,798,659

ADDITION OF CALCIUM COMPOUNDS TO THE CARBOTHERMIC REDUCTION OF SILICA

Vidas D. Dosaj, Midland; Daniel H. Flintger, Bay City, both of Mich., and James E. Trunzo, Eugene, Oreg., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 22, 1986, Ser. No. 944,733

Int. Cl.[4] C01B *33/02*

U.S. Cl. 204—164 **5 Claims**

1. In a process for the preparation of silicon from the reduction of silicon dioxide with a solid carbonaceous reducing agent, said process comprising:

(A) passing electrical energy into a reaction zone of a silicon furnace;

(B) feeding silicon dioxide and solid carbonaceous reducing agents into the reaction zone;

(C) recovering molten silicon from the reaction zone; and

(D) handling by-product gases from the reaction zone, the improvement comprising controlling and maintaining a calcium level in a range from a range from about 0.2 to 2.0 weight percent in the reaction zone of the silicon furnace by monitoring the calcium level in the molten silicon and feeding a calcium compound separately from the silicon dioxide and the carbonaceous reducing agents to supplement calcium content of the silicon dioxide and solid carbonaceous reducing agents, said calcium compound being selected from a group consisting of calcium oxide, calcium carbonate, and calcium fluoride.

4,798,660

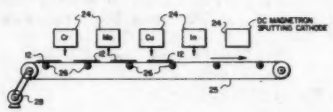
METHOD FOR FORMING CU IN SE_2 FILMS

James H. Ermer, Los Angeles, and Robert B. Love, Chatsworth, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 755,649, Jul. 16, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 942,918

Int. Cl.[4] C23C *14/38*

U.S. Cl. 204—192.17 **7 Claims**



1. A method for fabricating a copper indium diselenide semiconductor film comprising:

in a single vacuum chamber sequentially depositing a film of copper on a substrate by DC magnetron sputtering from a first cathode and depositing indium on said film of copper by DC magnetron sputtering from a second cathode to form a composite film of copper and indium; and

heating said composite film of copper and indium in the presence of a source of selenium at a temperature and for a time selected to cause interdiffusion of copper, indium and selenium to form a copper indium diselenide film.

4,798,661

GAS GENERATOR VOLTAGE CONTROL CIRCUIT

Stanley A. Meyer, 3792 Broadway Blvd., Grove City, Ohio 43123

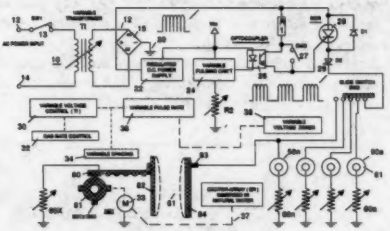
Filed Mar. 25, 1985, Ser. No. 715,749

Int. Cl.[4] C25B *9/04, 15/02*

U.S. Cl. 204—228 **41 Claims**

1. In a generator for producing a mixture of hydrogen and oxygen and other dissolved gas from natural water which generator includes at least a pair of plate exciters within a water containing vessel, a variable voltage source for applying a pulsating predetermined potential difference between the plates and wherein the rate of production of the mixture of gasses is controlled by varying at least one of the amplitude of

the voltage and the pulse repetition rate of the pulsating potential difference applied to the plate exciters, and in which said variable voltage source includes a means for restricting the current flow between the plate exciters to a minimum value relative to a predetermined potential difference applied to the plates, the improvement in the means for restricting said current flow comprising: variable voltage source means for converting an input voltage potential to unipolar d.c. voltage



pulses that are applied to the exciter plates and have a pulsating potential difference when measured from an arbitrary ground, said means further including means for regulating the voltage pulses in a repetitive frequency to inhibit the current flow caused by electron leakage between the plate exciters resulting from the amplitude of the applied voltage potential whereby said current flow is inhibited from exceeding a first minimum level.

4,798,662

CATHODE FOR ELECTROLYSIS AND A PROCESS FOR THE MANUFACTURE OF THE SAID CATHODE

Jacques Clerc-Renaud, La Mulatiere; Francis Leroux, Brignais, and Dominique Ravier, Lyons, all of France, assignors to Atochem, France

Filed Mar. 26, 1987, Ser. No. 31,086

Claims priority, application France, Apr. 3, 1986, 86 04767

Int. Cl.[4] C25B *11/00*

U.S. Cl. 204—290 R **5 Claims**

1. A cathode especially useful in the electrolysis of aqueous solutions of alkali metal halides consisting essentially of an electrically conducting substrate and a heterogeneous coating; said heterogeneous coating consisting of at least two coats a and b, coat a being in contact with the substrate and containing at least one of the constituents selected from precious metals, precious metal oxides, or mixtures of precious metal oxides and at least one oxide selected from the oxides of nickel, cobalt, iron, titanium, hafnium, niobium, tantalum or zirconium, and coat b in contact with the electrolyte and with a coat a and is a metal selected from nickel, cobalt, iron, their alloys, or the alloys of the former containing an atomic proportion of less than 15% phosphorous, boron, or sulfur, such that the ratio between the projected surface of the coat b and the projected surface of the substrate is greater than 95%.

4,798,663

SPUTTERING INSTALLATION FOR THE REACTIVE COATING OF A SUBSTRATE WITH HARD MATERIALS

Günther Herklotz, Bruchköbel, and Hans Eligehausen, Hanau, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

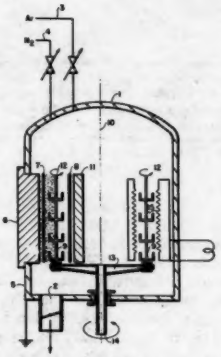
PCT No. PCT/EP86/00045, § 371 Date Sep. 30, 1986, § 102(e) Date Sep. 30, 1986, PCT Pub. No. WO86/04616, PCT Pub. Date Aug. 14, 1986

PCT Filed Jan. 31, 1986, Ser. No. 927,671

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1985, 3503398

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—298 **13 Claims**



1. Sputtering apparatus for the reactive coating of substrates with hard substances, especially with titanium nitride or titanium carbide, which has an evacuable housing at ground potential with a feed line for a reaction gas and a noble gas, and in which the sputtering surface of a magnetron serving as sputtering unit as well as at least one mounting for the substrate are disposed, the substrates being positionable in front of the sputtering surface by means of the mounting, characterized in that the mounting for the substrates is disposed in an ionization system with at least two electrodes of which the one electrode is operable as an electron emitter and the other electrode is at positive potential with respect to the emitter electrode, and wherein the substrate mounting itself is at a negative voltage with respect to the ground, and in which at least one magnet system prolonging the path of the electrons leaving the emitter electrode is disposed in the housing, which magnet system is disposed opposite the sputtering surface of the magnetron and the substrate and the electrodes are disposed between the sputtering surface and the magnet system.

4,798,664

ION SENSOR

Shuichiro Yamaguchi, Fuji; Norihiko Ushizawa, Fujinomiya, and Takeshi Shimomura, Fujinomiya, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,089

Claims priority, application Japan, Dec. 25, 1985, 60-290812; Dec. 28, 1985, 60-299000; Jan. 21, 1986, 61-10737

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—418 **47 Claims**

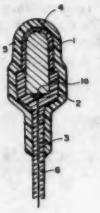
1. An ion sensor comprising:

an electrically conductive substrate;

an electrically polymerized redox layer having a redox function covering a surface of said electrically conductive substrate; and

an ion-selective layer exhibiting ion selectivity covering a

surface of said redox layer wherein said ion selective layer contains the following ingredients (a) - (d):



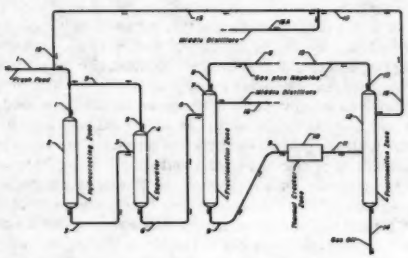
(a)	a polyvinyl chloride	100 parts by weight
(b)	ion carrier material	6–30 parts by weight
(c)	electrolytic salt	0–3.6 parts by weight
(d)	plasticizers	40–665 parts by weight.

4,798,665

COMBINATION PROCESS FOR THE CONVERSION OF A DISTILLATE HYDROCARBON TO MAXIMIZE MIDDLE DISTILLATE PRODUCTION

Michael J. Humbach, Wilmette, Ill., and John G. Hale, Egham, United Kingdom, assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 772,795, Sep. 5, 1985, Pat. No. 4,662,238. This application Apr. 27, 1987, Ser. No. 43,079
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] C10G *69/06*
U.S. Cl. 208—61 **16 Claims**



1. A process for the conversion of an aromatic-rich, distillable gas oil charge stock which is essentially free from asphaltenic hydrocarbons and possesses an aromatic hydrocarbon concentration greater than about 20 volume percent to selectively produce large quantities of high quality middle distillate while minimizing hydrogen consumption which process comprises the steps of:

(a) reacting said charge stock with hydrogen, in a catalytic hydrocracking reaction zone, at hydrocracking conditions including a maximum catalyst bed temperature in the range of about 60° F. (315° C.) to about 850° F. (454° C.) selected to convert at least a portion of said charge stock to lower-boiling hydrocarbon products including middle distillate and to convert at least about 10 volume percent of the aromatic hydrocarbon compounds contained in said charge stock to provide an increased concentration of paraffin hydrocarbon compounds in the resulting hydrocracking reaction zone effluent;

(b) separating said resulting hydrocracking reaction zone effluent to provide a middle distillate product stream and a paraffin-rich hydrocarbonaceous stream boiling at a temperature greater than about 700° F. (371° C.);

(c) recovering said middle distillate product stream;

(d) reacting said paraffin-rich hydrocarbonaceous stream recovered in step (b) in a non-catalytic thermal reaction zone at mild thermal cracking conditions including an elevated temperature from about 700° F. (371° C.) to about 980° F. (526° C.), a pressure from about 30 psig (207 kPa gauge) to about 1000 psig (6895 kPa gauge) and an equivalent residence time at 900° F. (482° C.) from about 1 to about 60 seconds to provide a non-catalytic thermal reaction zone effluent; and

(e) separating said non-catalytic thermal reaction zone effluent to provide a fraction boiling in the range from about 300° F. (149° C.) to about 700° F. (371° C.)

4,798,666

HYDROCRACKING CATALYST FOR MIDDLE DISTILLATES

Stephen L. Parrott, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 763,592, Aug. 8, 1985, Pat. No. 4,720,472. This application Oct. 15, 1987, Ser. No. 109,641
Int. Cl.[4] C10G *47/20*
U.S. Cl. 208—111 **19 Claims**

1. A hydrocracking process comprising the step of contacting

(A) a substantially liquid hydrocarbon containing feed, which has an initial boiling point under atmospheric pressure conditions in excess of about 400° F., with

(B) a free hydrogen containing gas and

(C) a catalyst composition comprising a support material consisting essentially of silica/titania on alumina which support material has been promoted with at least one compound of nickel,

at least one compound of molybdenum and at least one compound of phosphorus,

under such hydrocracking conditions as to obtain at least one liquid hydrocarbon-containing product stream having a lower initial boiling point and a higher API[60] gravity than said hydrocarbon containing feed;

wherein said catalyst composition contains about 0.1 to about 5 weight percent nickel and about 1 to about 15 weight percent polybdenum.

4,798,667

HYDROCARBON CONVERSION POLYMERIZATION CATALYST AND METHOD OF MAKING AND USING SAME

Russell S. Drago, and Edward E. Getty, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Division of Ser. No. 921,688, Oct. 22, 1986, Pat. No. 4,719,190. This application Jan. 11, 1988, Ser. No. 113,996
Int. Cl.[4] C10G *11/08*
U.S. Cl. 208—117 **2 Claims**

1. In a hydrocarbon conversion process wherein at least one hydrocarbon is contacted with a conversion catalyst under conversion conditions, the improvement comprising contacting said hydrocarbon with a catalyst prepared by reacting an adsorbent solid containing surface hydroxyl groups with a Lewis acid selected from a group consisting of aluminum halides, antimony halides and mixtures thereof and a halogenated organic solvent selected from the group consisting of CCl_4, $CHCl_3$ and mixtures thereof at temperature and for a time sufficient for said Lewis acid to react with at least a portion of said surface hydroxyl groups.

4,798,668

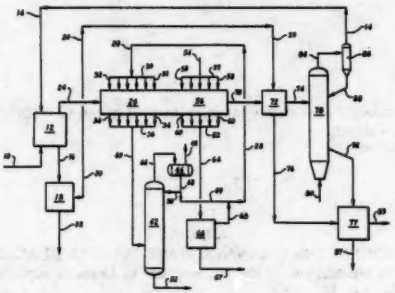
EXTRACTION OF HYDROCARBON-CONTAINING SOLIDS

Phillman N. Ho, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 824,832, Jan. 31, 1986, Pat. No. 4,695,373, which is a continuation of Ser. No. 694,009, Jan. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 599,480, Apr. 12, 1984, abandoned. This application Sep. 2, 1987, Ser. No. 92,376

Int. Cl.[4] C10G 1/00, 1/04

U.S. Cl. 208—428 20 Claims



1. A process for recovering hydrocarbon liquids from oil shale solids which comprises:

(a) heating said solids in a nonoxidizing atmosphere to a temperature between about 550° F. and about 900° F. in the absence of an added liquid organic solvent to produce heat treated oil shale solids;

(b) extracting hydrocarbons from said heat treated oil shale solids by contacting said solids in an extraction zone with a liquid organic solvent passed downwardly through said heat treated oil shale solids in such quantities that said solvent trickles through said solids so that there is a discontinuous liquid phase in contact with said solids through the entire extraction zone; and

(c) recovering said extracted hydrocarbons from said liquid organic solvent as said hydrocarbon liquids.

4,798,669

SYSTEM FOR TREATING WATER WITH OZONE

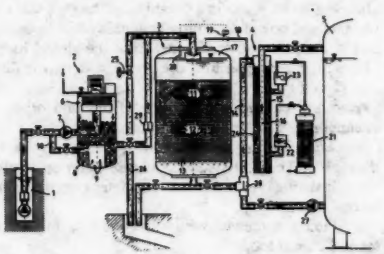
Bruno Bachhofer, Saentisstrasse 86, and Anton Locher, Bergstrasse 6, both of 7980 Ravensburg 1, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 141,867

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711407

Int. Cl.[4] C02F 1/78

U.S. Cl. 210—109 5 Claims



1. Water treatment system having an apparatus for the intensive pretreatment of untreated water with ozone, having a filter downstream comprising a filter tank, partly filled with filter materials having a reducing action, through which the pretreated water flows from top to bottom, in which process the residual ozone contained in the water is decomposed, and having an apparatus for the post-treatment of the water with ozone for the purpose of post-disinfection, wherein the excess ozone which accumulates in the upper part (17) of the filter tank and which added to the water during the pretreatment is fed anhydrously into the apparatus for the post-treatment of the filtered water.

4,798,670

SKIMMER VACUUM FILTER APPARATUS

William E. Treene, Upper Montclair, N.J., assignor to Hayward Industries, Inc., Elizabeth, N.J.

Filed Oct. 7, 1987, Ser. No. 105,878

Int. Cl.[4] E04H 3/20

U.S. Cl. 210—169 15 Claims

1. Apparatus useful in connection with the performance of a swimming pool vacuuming operation, said apparatus comprising, in combination, a skimmer assembly, said skimmer assembly including a skimmer well having first mounting means for mounting a strainer basket in said skimmer well during the performance of a swimming pool skimming operation and an outlet which communicates with a primary filter; a vacuuming assembly, said vacuuming assembly including a lid mounted across said skimmer well and a vacuum hose attached to said lid; a secondary filter removably mounted in said skimmer well in place of the strainer basket such that said secondary filter is interchangeable with the strainer basket, said secondary filter including a housing mounted directly below said lid by said first mounting means, said housing having an inlet end which is substantially open and an outlet end which is substantially closed, filtering means for filtering fine and coarse debris from water flowing through said filtering means, and positioning means for removably positioning said filtering means inside said housing such that fine and coarse debris are removed from water vacuumed from the swimming pool as the water passes through said filtering means while flowing from said inlet end of said housing to said outlet end of said housing, wherein said apparatus permits said secondary filter to perform a prefiltering function during a swimming pool vacuuming operation and permits the strainer basket to be used in place of said secondary filter to perform a straining function during a swimming pool skimming operation.

4,798,671

DEVICE FOR INWARD SUCTION OF LIQUID

Jan W. M. Mijers, and Johannes E. Steenhuisen, both of Veerweg, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Filed Mar. 24, 1987, Ser. No. 29,642

Claims priority, application Netherlands, Mar. 27, 1986, 8600784

Int. Cl.[4] B01D 27/08

U.S. Cl. 210—238 9 Claims

1. A device for taking liquid from a reservoir by inward suction with simultaneous filtration, comprising a flexible tube having at one end a filtering unit, which can be immersed in the liquid through an opening in the reservoir, and having a mouthpiece at another end, characterized in that (i) the mouthpiece is connected to the tube in a sealing manner via a flexible hollow member which forms a fluid connection between said tube and said mouthpiece, (ii) said mouthpiece tapering externally over at least a part of its length in the direction of the open front end remote from the tube, (iii) the flexible hollow member is connected to the tube by means of a connection means which externally comprises a radially outwardly projecting collar having an upright circumferential edge facing the mouthpiece, on which or to which edge a protective cap is connected in a sealing but detachable manner, (iv) the upright circumferential edge of the collar of the connection means has an outside diameter which is smaller than the cross-section of the opening in the reservoir, and (v) the end of the circumferential edge facing the mouthpiece comprises a radially outwardly projecting flange having a larger outside diameter than said opening in the reservoir.

4,798,672

CHARCOAL WATER FILTER/STRAINER

Val R. Knight, 176 Ocean Ave., Apt. 5, Jersey City, N.J. 07305

Filed Jul. 24, 1987, Ser. No. 77,665

Int. Cl.[4] B01D 27/02

U.S. Cl. 210—282 3 Claims

1. A charcoal water filter, comprising, a cylindrical cartridge, a rubber fitting secured to said cartridge, for rendering said cartridge secure in a water discharge outlet of a faucet, activated charcoal received in said cartridge, for removing toxic substances, a first mesh screen and a second mesh screen receiving said cartridge, for removing and retaining foreign particles from the water outlet, and a pair of aeration disks received in said cartridge for introducing oxygen into said water, and a plurality of openings angularly disposed and peripherally formed in said cartridge for entry of air into the interior of the cartridge at low water pressure discharge and to provide for a spray of water at high water pressure discharge with the water passing through said openings in an upward and

arcuate path for rinsing articles, as well as out of a bottom of said cartridge.

4,798,673

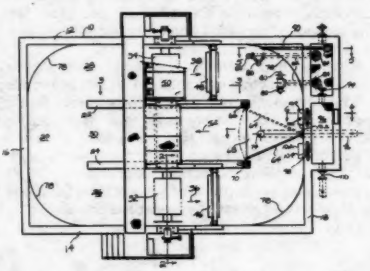
SEQUENCING CHANNEL WASTE WATER REACTOR

Clyde Huntington, Elgin, Ill., assignor to Lakeside Equipment, Bartlett, Ill.

Filed Jul. 6, 1987, Ser. No. 69,863

Int. Cl.[4] C02F 3/14

U.S. Cl. 210—629 13 Claims



7. A method of treating waste water in a single vessel comprising:

(a) providing in said vessel three side by side, elongated channels, interconnected at their opposed ends such that there exists a central channel flanked by two outer channels;

(b) flowing waste water in a closed loop through said central channel and one of said outer channels while isolating one end of the other outer channel from the closed loop;

(c) introducing oxygen into the waste water as it flows in said closed loop;

(d) removing clarified waste water from said other outer channel near said one end thereof;

(e) thereafter flowing waste water in a second closed loop through said central channel and said other outer channel while isolating one end of said one outer channel from said second closed loop;

(f) introducing oxygen into the waste water as it flows in said second closed loop;

(g) removing clarified waste water from said one outer channel near said one end thereof; and

(h) sequentially repeating steps (b), (c) and (d) followed by steps (d), (f) and (g).

4,798,674
SEPARATION OF ORGANIC LIQUIDS

Mordechai Pasternak, Spring Valley; Craig R. Bartels, and John Reale, Jr., both of Wappinger Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 10, 1988, Ser. No. 166,575
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—640 9 Claims

9. The method comprising:

concentrating a charge solution containing methanol and either dimethyl carbonate or methyl t-butyl ether oxygenate by,

maintaining a membrane of non-porous separating layer of cast polyvinyl alcohol which has been crosslinked with an aliphatic polyaldehyde containing at least three carbon atoms including those in said aldehyde groups;

maintaining a pressure drop across said non-porous separating layer of polyvinyl alcohol;

passing a charge aqueous solution containing methanol and either dimethyl carbonate or methyl t-butyl ether oxygenate into contact with the high pressure side of said non-porous separating layer of polyvinyl alcohol having properties which enable at least a portion of said methanol in said charge solution and a lesser portion of oxygenate to pass by pervaporation through said non-porous separating layer of polyvinyl alcohol as a lean mixture containing more methanol and less oxygenate than are present in said charge solution and said charge solution is converted to a rich liquid containing less methanol and more oxygenate than are present in said charge solution;

recovering as permeate from the low pressure side of said non-porous separating layer of polyvinyl alcohol said lean mixture containing more methanol and less oxygenate than are present in said charge solution, said lean mixture being recovered in vapor phase at a pressure below the vapor pressure thereof; and

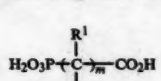
recovering as retentate from the high pressure side of said non-porous separating layer said rich liquid containing a lower methanol content and a higher oxygenate content than are present in said charge solution.

4,798,675
CORROSION INHIBITING COMPOSITIONS CONTAINING CARBOXYLATED PHOSPHONIC ACIDS AND SEQUESTRANTS

Richard J. Lipinski, Aurora, and Kelvin Y. Chang, Solon, both of Ohio, assignors to The Mogul Corporation, Chagrin Falls, Ohio

Filed Oct. 19, 1987, Ser. No. 110,138
Int. Cl.[4] C02F *5/14*
U.S. Cl. 210—700 14 Claims

1. A composition for inhibiting mineral scale and corrosion of metals in water which comprises from about 2 to 30 parts by weight per one million parts by weight of water of a carboxylated phosphonic acid having either formulae:



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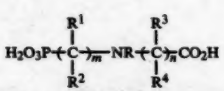
or



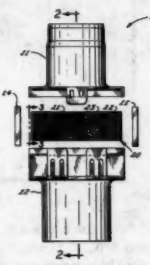
II

wherein m is from 1 to 6; n is from 0 to 6; R^1, R_2, R^3, and R^4, independently, is —H, an alkyl having from 1 to 12 carbon atoms, an aryl or an alkyl substituted aryl having from 6 to 15 carbon atoms, —OH, —SH, —NH_2, —PO_3H_2, —$CH_2PO_3H_2$, —CO_2H, —CH_2CO_2H, —halogen, —SO_3H; and R is —H, an alkyl having from 1 to 12 carbon atoms, an alkenyl having from 2 to 12 carbon atoms, an alkynyl having from 2 to 12 carbon atoms, a cycloalkyl having from 3 to 16 carbon atoms, an aryl or an alkyl substituted aryl having from 6 to 15 carbon atoms, methylene phosphonic acid, or methylene carboxylic acid; and from about 2 to 30 parts by weight per million parts by weight of water of a sequestrant selected from the group consisting of tartaric acid, citric acid, gluconic acid, and sulfur-containing lignosulfonates.

4,798,676
LOW PRESSURE DROP BACTERIAL FILTER AND METHOD

Vlado I. Matkovich, Glen Cove, N.Y., assignor to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 943,492, Dec. 19, 1986, abandoned.
This application May 18, 1988, Ser. No. 196,896
Int. Cl.[4] B01D *35/02*
U.S. Cl. 210—767 4 Claims



1. A method of filtering bacteria from exhaled human breath in a pulmonary function apparatus comprising passing the exhaled human breath through a housing disposed in close proximity to the mouth,

the housing having an inlet, an outlet, and a filter medium disposed therebetween, the inlet and the outlet being sized relative to the housing to result in flow of exhaled breath through the inlet, through the filter medium, and out of the outlet at substantially the same velocity as when exhaled from the mouth,

the filter medium having a nominal pore size in the range of about 50 microns to about 200 microns, the surface of the filter medium being dipsoed at an angle of at least about 160° relative to the direction of the breath approaching the filter medium whereby substantially all saliva droplets and aerosols impact upon and are retained by the filter medium.

4,798,677
FILTERATOR FOR SEPARATOR

David C. Irwin, 2900 North Grand, Amarillo, Tex. 79107

Filed Jul. 24, 1987, Ser. No. 77,613
Int. Cl.[4] B01D *17/02, 21/02*
U.S. Cl. 210—799 18 Claims

1. In a method of separation involving a separator having

a. an elongated cylindrical container having

b. vertical axis,

c. liquid in the container with

d. a liquid surface level near the top thereof,

e. scraper means in the container for removing tallow from the liquid surface level,

f. a sump in the bottom of the container with

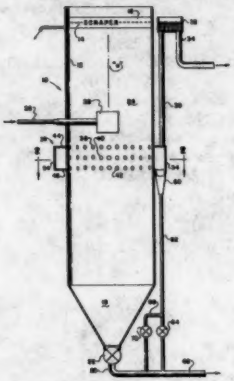
g. a sump line and

h. a sump valve for draining solids which have settled from the liquid,

i. a quiescent zone of liquid between the scraper means and sump,

j. an inlet conduit for flowing a liquid mixture of at least water, tallow, and solids into the quiescent zone of the separator at

k. an inlet diffuser,
kk. a plenum ring having top, bottom, and outer plates encircling the container at the quiescent zone,
l. an outlet pipe connected into the top plate of the plenum ring having a cross sectional area taking liquid from the quiescent zone;
m. wherein the improvement comprises:



n. withdrawing liquid from the quiescent zone from a plurality of holes in a band around the container, thereby
o. minimally disturbing the quiescent zone, and
p. withdrawing the liquid from a plurality of holes into the plenum which has cross sectional area many times greater than the cross sectional area of the outlet pipe, thereby having a gentle flow of the liquid within the plenum.

4,798,678

HYDROCARBON CONTAINING ANTI-OXIDANT SYSTEM

Christopher S. Liu, Poughkeepsie; Larry D. Grina, Wappingers Falls, and Maria M. Kapuscinski, Carmel, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 27, 1987, Ser. No. 43,014
Int. Cl.[4] C10M *141/06*
U.S. Cl. 252—50 **20 Claims**

1. An anti-oxidant composition comprising
(i) a hindered phenol; and
(ii) a piperazine.

11. A lubricating oil composition comprising
(i) a major portion of a lubricating oil; and
(ii) a minor effective anti-oxidant portion of, as additive a hindered phenol and a piperazine or substituted piperazine.

4,798,679

CONTROLLED SUDSING STABLE ISOTROPIC LIQUID DETERGENT COMPOSITIONS

Artemio Castro, Fairfield, and Michael S. Showell, Cincinnati, both of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed May 11, 1987, Ser. No. 48,155
Int. Cl.[4] C11D *3/12, 9/36, 17/08*
U.S. Cl. 252—174.15 **13 Claims**

3. A stable isotropic liquid detergent composition having a controlled suds pattern, comprising:
(a) a suds suppressing amount of a suds controlling agent consisting essentially of:
(i) polydimethylsiloxane fluid having a viscosity of from about 20 cs. to about 1500 cs. at 25° C.;
(ii) from about 5 to about 70 parts per 100 parts by weight of (i) of non-crystalline silica selected from the group consisting of siloxane resin composed of $(CH_3)_3SiO_{\frac{1}{2}}$ units and SiO_2 units in a ratio of $(CH_3)_3SiO_{\frac{1}{2}}$ units to SiO_2 units of from about 0.6:1 to about 1.2:1; solid silica gel; and mixtures thereof;
(b) from about 1% to about 60% by weight of a sudsing detergent surfactant selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic, and cationic surfactants and mixtures thereof; and
(c) from 0% to about 95% by weight of water, and
(d) cyclomethicone dispersing agent which is premixed with the suds controlling agent prior to adding the suds controlling agent to the detergent composition.

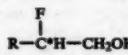
4,798,680

OPTICALLY ACTIVE COMPOUND, PROCESS FOR PRODUCING SAME AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Hiroyuki Nohira; Masanao Kamei; Shinichi Nakamura, all of Urawa; Kazuo Yoshinaga, Machida; Mariko Kai, Saitama, and Kazuharu Katagiri, Tama, all of Japan, assignors to Canon Kabushiki Kaisha and Yamakawa Yakuhin Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,376
Claims priority, application Japan, Oct. 18, 1985, 60-232886; Feb. 26, 1986, 61-40793
Int. Cl.[4] C09K *19/52*; C07C *31/34*
U.S. Cl. 252—299.01 **21 Claims**

1. An optically active 2-fluoro-1-alkanol compound represented by the formula (Ia):



(Ia)

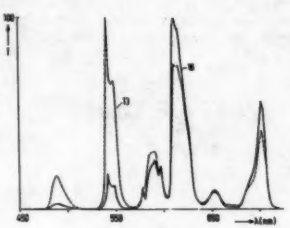
wherein R is an alkyl group having 1–16 carbon atoms, and C* is an asymmetric carbon atom.

4,798,681

LUMINESCENT QUARTZ GLASS, METHOD OF PREPARING SUCH A GLASS AND LUMINESCENT SCREEN PROVIDED WITH SUCH A GLASS

Gerrit Oversluizen; Joseph G. Van Lierop, and Anne-Marie A. Van Dongen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1987, Ser. No. 105,922
Claims priority, application Netherlands, Oct. 8, 1986, 8602519
Int. Cl.[4] C03C *3/06, 3/095*; C09K *11/08*
U.S. Cl. 252—301.4 F **7 Claims**



1. A luminescent quartz glass activated by a rare earth metal and consisting essentially of glass matrix oxides: SiO_2 and from 0 to 0.15 mol of MO per mol of SiO_2 in which MO represents at least one of the oxides selected from the group consists of Al_2O_3, B_2O_3, P_2O_5, ZrO_2, Sc_2O_3, Y_2O_3, La_2O_3, Gd_2O_3, Lu_2O_3, the alkali metal oxides and the alkaline earth metal oxides,

characterized in that the glass further consists essentially of at least one of the oxides selected from the group consisting of Tb_2O_3 and Ce_2O_3 as activator oxides in a quantity of 1 to 15 mol% calculated with respect to the glass matrix oxides.

4,798,682

OIL-IN-WATER EMULSIONS WITH INCREASED VISCOSITY UNDER SHEAR STRESS

Achim Ansmann, Hilden, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 6, 1986, Ser. No. 872,306

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1985, 3521713

Int. Cl.[4] B01J 13/00; C08L 1/26; A61K 7/06

U.S. Cl. 252—312 20 Claims

1. An oil-in-water emulsion having increased viscosity under shear stress comprising a continuous aqueous phase and a discontinuous oil phase, wherein said continuous aqueous phase contains a combination of hydrocolloids consisting essentially of:

(a) at least one water-soluble nonionic cellulose ether; and

(b) at least on water-soluble salt of a crosslinked acrylic acid polymer or acrylic acid copolymer having a weight average molecular weight of about 1,000,000 to 5,000,000,

in a ratio a:b by weight of about 9:1 to about 1:9.

4,798,683

METHOD FOR CONTROLLING CORROSION USING MOLYBDATE COMPOSITIONS

Bennett P. Boffardi, Bethel Park, and Susan P. Rey, Coraopolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 21, 1988, Ser. No. 184,239

Int. Cl.[4] C23F 11/00

U.S. Cl. 252—389.54 2 Claims

1. A method for inhibiting corrosion in an aqueous system comprising adding to said system an effective amount of a corrosion inhibiting composition comprising:

(a) a molybdate ion source; and

(b) a water-soluble component selected from the group consisting of polymaleic anhydride; amine adducts of polymaleic anhydride; polymers prepared by polymerizing maleic anhydride with dimethyl diallyl ammonium chloride or homologs thereof; polymers prepared from 50–70%, by weight, acrylic acid or methacrylic acid, 10–40%, by weight, 2-acrylamido-2-methylpropyl sulfonic acid or 2-methyacrylamido-2-methylpropyl sulfonic acid and 10–30%, by weight, of a polyalkyleneoxide compound; salts of the above described polymers; phosphonates selected from the group consisting of 2-phosnphonobutane-1,2,4 tricarboxylic acid and hydroxyphosphono acetic acid; phosphino carboxylic acids; polyphosphoric acid and polyhydroxy esters of polyphosphoric acid; wherein the weight of (a):(b), on an active basis, ranges from about 10:1 to about 1:10.

4,798,684

NITROGEN CONTAINING ANTI-OXIDANT COMPOSITIONS

Mary F. Salomon, Cleveland Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jun. 9, 1987, Ser. No. 59,884

Int. Cl.[4] C10M 135/22

U.S. Cl. 252—47.5 42 Claims

1. A composition of matter which is the amine terminated reaction product obtained from a secondary aromatic monoamine with a beta-thiodialkanol wherein the equivalents of the beta-thiodialkanol are greater than the equivalents of the secondary monoamine.

35. A lubricating composition comprising a major amount of an oil of lubricating viscosity and a minor amount of the composition of claim 1.

4,798,685

PRODUCTION OF BASE-TYPE CONDUCTING POLYMERS

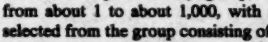
Stuart I. Yaniger, Palmdale, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Oct. 20, 1986, Ser. No. 920,474

Int. Cl.[4] H01B 1/00, 1/06

U.S. Cl. 252—500 18 Claims

1. A process for producing a conductive polymer which comprises reacting a base-type non-conductive polymer containing carbon-nitrogen linkages and having the formula:



where A comprises an aryl group, and y is an integer ranging from about 1 to about 1,000, with an R^+ donor compound selected from the group consisting of RX and R_3OX, where R is selected from the group consisting of alkyl containing 1 to 20 carbon atoms, and aryl, and X is selected from the group consisting of halogen, PF_6^-, $SbCl_6^-$ and benzene sulfonate, said R group being capable of covalently binding to the nitrogens of said polymer, the molar proportions of R^+ donor compound to non-conductive polymer ranging from about 0.01 to about 2 R^+ groups per nitrogen, and forming an electrically conductive polymer containing said R groups covalently linked to the nitrogen atoms of the polymer.

4,798,686

ORGANIC POLYMERS WITH ELECTRICAL PROPERTIES

Jürgen Hocker, Bergisch-Gladbach; Ludwig Rottmaier, Odenthal-Gloebusch; Klaus Reinking, Wermelskirchen; Jürgen Kirsch, Cologne, and Heinz-Josef Füllmann, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 18, 1986, Ser. No. 932,077

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542231

Int. Cl.[4] H01B 1/00

U.S. Cl. 252—500 6 Claims

1. An electrically conductive organic polymer comprising an organic polymer selected from thermoplastics, thermosetting resins, elastomers and lacquers and 5–80% by weight based on the total weight of the electrically conductive polymer of a sulfur-containing pyropolymer wherein said pyropolymer is obtained by pyrolysis of a sulfur-containing condensation product of aromatic compounds and sulfur or sulfur-releasing compounds.

4,798,687

2-AMINO-N-[1,2-DIPHENYL-1-(THIFLUOROMETHYL-)ETHYL]ACETAMIDE DERIVATIVES

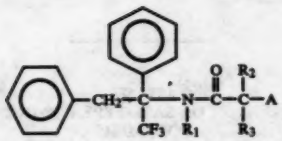
Ronald C. Griffith, Pittsford, and James J. Napier, Rochester, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 6, 1987, Ser. No. 11,816

Int. Cl.[4] C07C 103/50

U.S. Cl. 260—501.1 6 Claims

1. The compound



where R_1, R_2 and R_3 are hydrogen or methyl and A is amino, C_1–C_4 monoalkylamino, C_2–C_8 dialkylamino, cyclopropylamino, 1-pyrrolidinyl, 1-piperidinyl, or 4-morpholinyl or the pharmaceutically acceptable acid salts thereof.

4,798,688

2-ALKOXY-5-CHLORO-BENZENESULFONATES USEFUL FOR THE PREPARATION OF 2-ALKOXYBENZOSULFONAMIDES

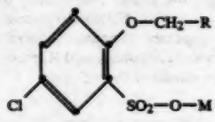
Franz-Josef Jaeggi, Baton Rouge, La., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 836,288, Mar. 5, 1986, Pat. No. 4,709,092. This application Aug. 26, 1987, Ser. No. 90,261

Int. Cl.[4] C07C *143/40*

U.S. Cl. 260—512 R 7 Claims

1. A 2-alkoxy-5-chlorobenzosulfonic acid alkali metal salt of formula V



(V)

wherein R is chloromethyl, methoxymethyl, C_1–C_4alkyl or trifluoromethyl and M is a sodium or potassium atom.

4,798,689

ARRANGEMENT FOR CONTROLLING A VAPORIZER BY MEANS OF PRESSURE FLUCTUATIONS

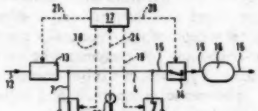
Ulrich Heim, Lübeck, and Scato Albarda, Gross Schenkenberg, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,449

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702136

Int. Cl.[4] A61M *16/18*

U.S. Cl. 261—39.1 5 Claims



1. An arrangement for generating a gas mixture, the arrangement comprising:

supply means for supplying a carrier gas;

a user supply line for conducting a gas mixture to a user;

a vaporizer line starting at said supply means and opening into said user supply line;

a vaporizer for vaporizing a medium, said vaporizer having an input and an output for connecting said vaporizer into said vaporizer line;

a bypass line bridging said vaporizer line and connecting said supply means to said supply line;

primary switching means for alternately interrupting said vaporizer line at said input and at said output; and,

ancillary switch means for interrupting said user supply line when said vaporizer line is interrupted at said output.

4,798,690

MOLDING A GLASS-PLASTIC COMPOSITE LENS

Sheldon L. Levy, Prairie Village, Kans., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 3, 1986, Ser. No. 926,617

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—1.7 4 Claims

1. A method for producing a molded optical lens comprising an optical glass substrate bonded to a thermoplastic element, comprising the steps of:

providing a heated composite of said substrate in contact with said thermoplastic element at a temperature sufficient to soften said thermoplastic element for a molding operation;

juxtaposing said heated composite in a mold cavity characterized by a predetermined surface configuration, said cavity being at a temperature in the range of about 40°–50° C., whereby said composite is cooled and molded into said configuration to form said optical lens whereby said mold remains essentially isothermal;

removing said molded optical lens from said cavity.

4,798,691

CAPSULE-SHAPED POLYMER PARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

Kiyoshi Kasai, Yokkaichi; Masayuki Hattori, Ama; Hiromi Takeuchi, and Nobuo Sakurai, both of Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00544, § 371 Date May 23, 1986, § 102(e) Date May 23, 1986, PCT Pub. No. WO86/02017, PCT Pub. Date Apr. 10, 1986

PCT Filed Oct. 2, 1985, Ser. No. 871,416

Claims priority, application Japan, Oct. 3, 1984, 59-206172

Int. Cl.[4] A61J *5/00*; B01J *13/02*; B32B *25/00, 27/00*

U.S. Cl. 264—47 14 Claims

1. A process for producing capsule-shaped polymer particles, comprising the steps of:

dispersing finely-divided particles of a polymer in water;

adding a polymerizable monomer component comprising (i) a cross-linkable monomer and a hydrophilic monomer, and (ii) an oil substance to the water dispersion, whereby the monomer component and the oil substance are absorbed in the finely-divided polymer particles and said polymer particles are soluble in said polymerizable monomer component; and

polymerizing said monomer component to produce capsule-shaped polymer particles containing said oily substance on the inside thereof, wherein said polymer is different than said capsule-shaped polymer resulting from said polymerizing step.

4,798,692

METHOD FOR CONTROLLING AND/OR REGULATING THE INJECTION MOLDING IN INJECTION MOLDING MACHINES

Eberhard Biersch, Stuttgart; August Burr, Schwäbisch Gmünd, and Klaus Hofmann, Waiblingen-Beinstein, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

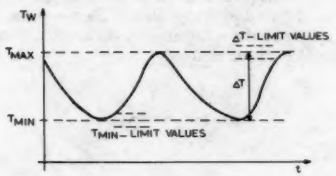
PCT No. PCT/DE85/00219, § 371 Date Mar. 11, 1986, § 102(e) Date Mar. 11, 1986, PCT Pub. No. WO86/00563, PCT Pub. Date Jan. 30, 1986

PCT Filed Jun. 28, 1985, Ser. No. 857,741

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425459

Int. Cl.[4] B29C *45/78*

U.S. Cl. 264—40.6 5 Claims



1. A method of controlling and/or regulating an injection molding of a mass through measurement of temperature in an injection molding tool of an injection molding machine, the injecting molding including providing an injection molding tool with a bore, and a mold pocket with a surface, subjecting the tool to a temperature and a mass to be injection molded to a temperature, cyclically injecting the mass into the mold pocket so as to thereby produce temperature jumps in the mold pocket, the method comprising the steps of:

feeding only one thermosensor into the bore of the injection molding tool to a position between 1 mm and 2 mm inclusive from the mold pocket surface;

recording the temperature jumps through the thermosensor so as to produce measurement results;

monitoring the measurement results with respect to predetermined maximum permissible temperature deviations;

using the measuring results to control the mass temperature and the tool temperature, the step of monitoring the measurement results including monitoring a minimum temperature T_{min} and a temperature difference ΔT with respect to predetermined maximum permissible temperature deviations, the temperature difference representing the temperature jump as recorded through the thermosensor and being the difference between a maximum and the minimum temperatures $T_{max}-T_{min}$, the step of using the measuring results including using the minimum temperature T_{min} to regulate the tool temperature and using the temperature difference ΔT to regulate the mass temperature; and indicating when a temperature recorded through the thermosensor exceeds the predetermined maximum permissible temperature deviations, the indicating including actuating a signal for controlling quality control or for turning off the machine.

4,798,693

METHOD OF MANUFACTURING AN ELECTROCHEMICAL DEVICE

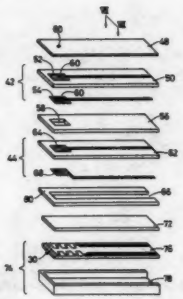
Syunzo Mase, Ama, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 725,672, Apr. 22, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 81,631

Claims priority, application Japan, Apr. 26, 1984, 59-84677

Int. Cl.[4] G01N *27/46*

U.S. Cl. 264—44 10 Claims



1. A method of manufacturing an electrochemical device which has a planar electrochemical cell structure including a planar solid electrolyte body and at least two electrodes disposed in contact with the solid electrolyte body, the device also including a heating element, comprising the steps of:

forming a first unfired ceramic layer on a first side of an unfired electrochemical cell structure, said first unfired ceramic layer being given a porous structure by firing thereof;

forming a second unfired ceramic layer on a second side of said unfired electrochemical cell structure, such that said second unfired ceramic layer does not contact either of said at least two electrodes, said second unfired ceramic layer being made of an electrically insulating material and being given a porous structure by firing thereof, said second unfired ceramic layer cooperating with said first unfired ceramic layer to prevent warpage of the planar electrochemical cell during co-firing of the unfired structure and unfired layers of the electrochemical cell;

forming an unfired heater layer for the heating element, said unfired heater layer being embedded in said second unfired ceramic layer;

forming a gas-tight unfired ceramic layer on one of the opposite sides of the second unfired ceramic layer which is remote from said first unfired ceramic layer, said gas-tight layer protecting the heater layer from exposure to a gas to be analyzed using said device; and

co-firing said unfired electrochemical cell structure, said first unfired ceramic layer, said second unfired ceramic layer, said unfired heater layer, and said gas-tight unfired ceramic layer to form said electrochemical device.

4,798,694

METHOD FOR PRODUCING COMPOSITE MATERIALS

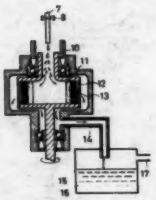
Hiroyuki Sugata, Atsugi; Kouhei Nakata, Yokohama; Nobutoshi Mizusawa, Sagamihara; Satoshi Yuasa, Yokohama; Masahiro Haruta, Tokyo; Takashi Hamamoto, Yokohama, and Kuniji Osabe, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,815

Claims priority, application Japan, Aug. 9, 1985, 60-174283; Aug. 9, 1985, 60-174285; Aug. 9, 1985, 60-174286; Aug. 9, 1985, 60-174287; Aug. 26, 1985, 60-185767; Aug. 26, 1985, 60-185768; Aug. 26, 1985, 60-185769; Aug. 26, 1985, 60-185770; Sep. 25, 1985, 60-210283; Sep. 25, 1985, 60-210284; Sep. 25, 1985, 60-210285; Sep. 25, 1985, 60-210286

Int. Cl.[4] B28B *1/28*; B29B *7/30*; B29C *41/04, 41/22*

U.S. Cl. 264—60 14 Claims



1. A process for producing a composite material comprising:

(a) mixing a plurality of different particulate constituents in a fluid to form a mixture, the mixing ratio of the different particulate constituents being varied over a period of time;

(b) feeding the mixture into a central portion of a rotating molding vessel having an interior cavity and filter material aroung the circumference which allows for fluid communication between said interior cavity and the exterior of said molding vessel said feeding step taking place over said period of time to deposit said different particulate constituents in a ratio therebetween varying in the rotation radius direction and in correspondence with the mixing ratio;

(c) applying a sufficient rotational speed to said molding vessel to applying a centrifugal force to said mixture to force the fluid from the particulate constituents and through said filter material;

(d) controlling said rotational speed so as to vary the thickness of said layers; and

(e) fixing the deposited particulate constituents.

4,798,695

PROCESS FOR THE PRODUCTION OF LAMINATED GLASS PLATES

Dieter G. Redel, Industriestr 18, Waldmohr, Fed. Rep. of Germany

Filed Apr. 7, 1987, Ser. No. 35,503

Claims priority, application European Pat. Off., Apr. 8, 1986, 86104785.0

Int. Cl.[4] B29C *51/00*

U.S. Cl. 264—164 7 Claims

1. Process for the production of multilayer glass plates of a plurality of panes spaced from one another in a frame with hardenable synthetic material and shaped bodies in the intervening space between the panes, said process comprising the steps of:

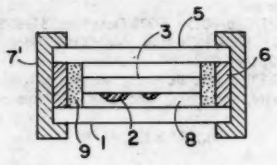
applying synthetic material onto a horizontally positioned first pane of glass, the synthetic material being applied before hardening while in a viscous state at selected places and in uneven thickness,

putting shaped bodies onto or between the surface portions which are covered with synthetic material,

laying a second pane at a spaced interval over the first pane such that the synthetic material is not touched,

surrounding the packet consisting of the two panes with the frame,

rotating the packet through 180°,



maintaining the packet in the rotated position while the viscous synthetic material flows downwardly with a formation of threads or drops joining the two panes, and

bonding the two panes together by the threads or drops of hardened synthetic material.

4,798,696

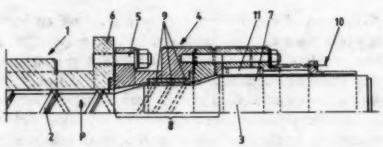
METHOD FOR EXTRUSION OF PLASTIC TUBES, AND AN APPARATUS FOR CARRYING OUT SAID METHOD

Boen Per, Fredrikstad, Norway, assignor to A/S Sonnichsen Rørvalseverket, Oslo, Norway

Filed May 8, 1987, Ser. No. 47,781

Int. Cl.[4] B29C *47/24*

U.S. Cl. 264—209.2 3 Claims



1. A method for extrusion of plastic tubes by a screw extruder having a screw line and a tube molding head comprising an external stationary nozzle and a mandrel supported against a nozzle wall by means of ribs or spoke, the method comprising the steps of;

rotating plastic to be extruded in the same direction as the rotation of said screw extruder to form screw line shaped strips; and

flow welding said strips to form a tube.

2. Apparatus for extrusion of plastic tubes comprising a screw extruder having a screw line and a tube molding head including an external stationary nozzle having a passage corresponding to an external contour of a tube to be extruded;

a rotatable mandrel having a cross-section corresponding to the internal contour of said tube;

ribs for supporting said mandrel within said nozzle, said ribs extending along a screw line and being attached to said nozzle, external faces of said ribs being in supporting contact with said mandrel, said screw line of said ribs having a direction opposite that of said extruder screw whereby plastic to be extruded is rotated in the same direction as the rotation of said screw extruder to form screw line shaped strips; and

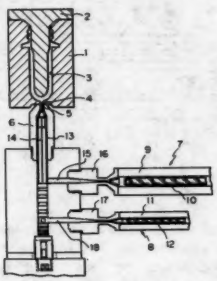
means for flow welding said strips to form a tube.

4,798,697

PROCESS FOR PREPARATION OF INJECTION MOLDED BODY OF OLEFIN/VINYL ALCOHOL COPOLYMER

Shigeso Nohara, Yokohama; Sadao Hirata, Kamakura; Junichi Matsuo, Yokohama; Masami Hirano, Yokohama, and Isao Tanikawa, Ayase, all of Japan, assignors to Toyo Seikan Kaisha, Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 32,646
Claims priority, application Japan, Mar. 31, 1986, 61-71236
Int. Cl.[4] B29C 45/16, 45/46
U.S. Cl. 264—255 9 Claims



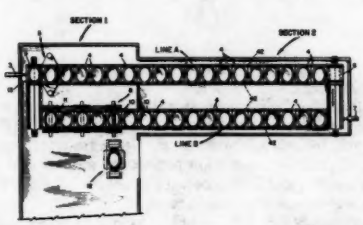
1. A process for the production of an injection-molded body of an olefin/vinyl alcohol copolymer, which comprises melt-kneading in the presence or absence of a radical generator a composition comprising (i) a high-molecular-weight olefin/vinyl alcohol copolymer having a melt flow rate of 0.4 to 6.0 g/10 min as determined at 190° C. and a vinyl alcohol content of 40 to 80 mole % and (ii) a low-molecular-weight olefin/vinyl alcohol copolymer having a melt flow rate of 3.0 to 60 g/10 min as determined at 190° C., which is higher by at least 0.5 g/10 min than that of the high-molecular-weight ethylene/vinyl alcohol copolymer (i), and a vinyl alcohol content of 45 to 85 mole % at a weight ratio of from 98/2 to 40/60, and injecting the melt-kneaded composition into a mold through a nozzle to thereby form a layer of an olefin/vinyl alcohol copolymer having an increased molecular weight and a weight average molecular weight (Mw) of at least 80,000.

4,798,698

CLOSED LOOP SYSTEM FOR THE MANUFACTURE AND HANDLING OF CONCRETE PIPE

Carl R. Joelson, 2501 Bayshore Rd., Nokomis, Fla. 33555

Continuation of Ser. No. 853,205, Apr. 17, 1986, abandoned.
This application Dec. 18, 1987, Ser. No. 135,542
Int. Cl.[4] B28B 21/14, 21/56
U.S. Cl. 264—271.1 1 Claim



1. A closed single level loop process for manufacturing and handling large, heavy reinforced concrete pipe comprising moving intermittently a reinforcing cage from a starting station on a single level to a molding station on the same level, freshly molding a reinforced concrete pipe around said reinforcing cage, while holding the freshly molded concrete pipe only by ends of the pipe, curing said held freshly molded pipe by intermittently moving said pipe through a curing station on the same level as said molding station, intermittently moving said cured held pipe to said starting station from said curing station, releasing the pipe and repeating the cycle.

4,798,699

WEAR SLEEVE FOR A CONTROL ROD END PLUG

Samuel Cerni, Churchill Boro; John F. Wilson, Murrysville Boro, and Robert K. Gjertsen, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 26, 1984, Ser. No. 634,725
Int. Cl.[4] G21C 7/10
U.S. Cl. 376—327 3 Claims

1. In a nuclear reactor including at least one guide thimble and at least one control rod received in said guide thimble and supported for movement relative thereto, said control rod having an elongated tubular cladding member and an end plug attached to an end of said member which extends into said guide thimble and is subject to vibratory contact with a portion of said guide thimble, the improvement which comprises:

a wear sleeve surrounding an upper portion of said end plug adjacent said end of said cladding member of said control rod and disposed above a lower tip portion of said end plug so as to provide a contact interface between said end plug and said guide thimble portion, said wear sleeve having a cross sectional shape concentric with that of said end plug upper portion, said wear sleeve having means forming a connection with complementary means on said end plug for attaching said wear sleeve to said end plug upper portion and being composed of material similar to that of said thimble and dissimilar from that of said end plug.

4,798,700

CERAMIC INSTALLATIONS

Claus Elter, Bad Duerkheim; Edgar Horuischer, Mannheim; Herrmann Schmitt, Winnweiler, and Josef Schoening, Hambruecken, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Fed. Rep. of Germany

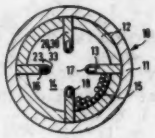
Filed Jan. 21, 1987, Ser. No. 5,656
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601750
Int. Cl.[4] G21C 7/08, 7/22
U.S. Cl. 376—338 11 Claims

1. In combination with a gas-cooled high temperature reactor having discrete absorber material elements for shutting down said reactor and a core filled with spherical fuel elements,

a graphite side reflector comprising at least one nose-shaped projection protruding radially into the reactor core from said graphite side reflector,

said at least one nose-shaped projection comprising: (a) at least one vertically disposed cavity adapted to receive said discrete absorber material elements, (b) a vertically dis-

posed, continuous opening which forms a passageway for communication between said cavity and the core of the reactor, and (c) blocking means cooperatively engaged with said projection and positioned within said continuous opening for preventing direct communication between said cavity and the core of the reactor,



said opening having a maximum width adjacent said cavity which is less than the minimum dimension of said discrete absorber elements in order to prevent passage of said elements into said continuous opening for said cavity.

4,798,701

METHOD OF SYNTHESIZING AMORPHOUS GROUP IIIA-GROUP VA COMPOUNDS

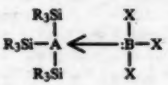
Lawrence D. David, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1987, Ser. No. 72,486
Int. Cl.[4] C22C *28/00, 21/00*; C01B *25/08, 21/06*
U.S. Cl. 420—528 **38 Claims**

1. A method of synthesizing amorphous Group IIIA-Group VA compounds comprising the steps of:

(a) mixing equimolar amounts of a tris(trialkylsilyl) compound of a Group IIIA element with a halide of a Group VA element in a non-protic, non-active hydrogen containing dried, deoxygenated organic solvent wherein the Group IIIA element is selected from the group consisting of aluminum, boron, gallium, indium, and mixtures thereof and the Group VA element is selected from the group consisting of antimony, arsenic, nitrogen, phosphorus, and mixtures thereof;

(b) reacting the components of the mixture of step (a) to form an adduct of the general formula:



wherein

R=an alkyl group;

A=aluminum, boron, gallium, indium, or mixtures thereof;

B=antimony, arsenic, nitrogen,

phosphorus, or mixtures thereof; and

X=bromine, chlorine, fluorine, or iodine,

thereinafter which is formed a Group IIIA-Group VA compound having the general formula AB and a halide by-product having the general formula R_3SiX; and

(c) removing the R_3SiX by-product to recover the AB stoichiometric condensed phase, wherein said phase contains less than about 10% by volume crystallinity.

4,798,702

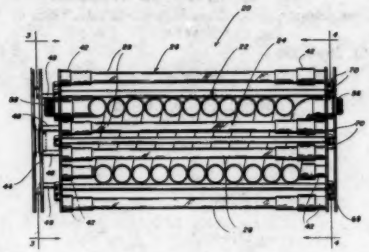
STERILIZER UNIT FOR FLUID MEDIA AND PROCESS

Robert E. Tucker, P. O. Box 414, Florissant, Mo. 63032

Filed Sep. 10, 1986, Ser. No. 906,030
Int. Cl.[4] G01N *23/10, 23/12*
U.S. Cl. 422—24 **14 Claims**

1. A process of sterilizing a fluid media comprising the steps of:

(a) providing a length of thin walled corrugated pipe in the shape of a helix coiled around an ultraviolet germicidal radiation source, said corrugated pipe being formed of a tough, flexible fluorinated polyalkylene resin which is resistant to buildup of film on the inner surface thereof, which remains transparent to ultraviolet rays over an extended period of time and which is capable of being used without sidewall support;



(b) passing fluid media through the corrugated pipe; and,

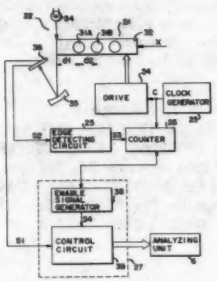
(c) simultaneously exposing the fluid media to ultraviolet germicidal radiation by irradiating the fluid media through the walls of said corrugated pipe with said germicidal radiation source.

4,798,703

PHOTOMETRIC APPARATUS IN AUTOMATIC CHEMICAL ANALYZER

Tomiharu Minekane, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 6, 1985, Ser. No. 805,617
Claims priority, application Japan, Dec. 7, 1984, 59-257406
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—65 **14 Claims**



1. A photometric apparatus in an automatic chemical analyzer, comprising:

photometric means including light-projecting means for projecting light and light-receiving means for obtaining a signal including a photometric signal from incident light projected by said light-projecting means, said light-projecting and light-receiving means forming a light path therebetween for measurement;

a cell assembly including a holder having an optical edge for obstructing said light path and a plurality of cells containing samples to be analyzed, said cells being spaced apart in said holder in a conveying direction and one of said cells being adjacent said optical edge, each of said cells having an analyzing portion located at a preselected position

therein, said analyzing portions of adjacent cells being separated by a first predetermined distance and said analyzing portion of said cell adjacent said optical edge being separated from said optical edge by a second predetermined distance;

drive means for causing relative movement between said cell assembly and said light path at a predetermined speed in said conveying direction for positioning said cells successively in said light path between said light-projecting means and said light-receiving means;

edge detecting means responsive to said light-receiving means for detecting the passage of said optical edge of said holder through said light path;

signal generating means responsive to said drive means and to the detection of said optical edge of said holder by said edge detecting means for generating an enable signal for measurement of said cells at said analyzing portions, said signal generating means including means for generating said enable signal upon detection of said optical edge and at succeeding intervals determined by a relationship between at least one of the predetermined distances between said optical edge and said adjacent portion of an adjacent cell and respective analyzing portions of adjacent cells, and said predetermined speed of movement of said cell assembly;

means for analyzing said photometric signal obtained by said light-receiving means from incident light projected by said light-projecting means and passing through said cells; and

control means responsive to said enable signal from said signal generating means for transmitting said photometric signal obtained by said light-receiving means to said analyzing means for photometric analysis of said cells at times when said analyzing portions of said cells appear in said light path.

4,798,704

PREHEATING APPARATUS EMPLOYED IN ANALYSIS OF HYDROGEN AND CARBON

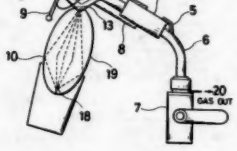
Keiji Saito, Okayama; Yoshiro Takizawa, Chiba, and Isao Takagi, Okayama, all of Japan, assignors to Kawasaki Steel Techno-Research Corporation, Tokyo, Japan

Filed Oct. 6, 1986, Ser. No. 915,554

Claims priority, application Japan, Oct. 7, 1985, 60-223276

Int. Cl.[4] G01N *33/20*

U.S. Cl. 422—99 **4 Claims**



1. A preheating apparatus for removing moisture and carbon adhering to a solid sample before the sample is transferred into a furnace in which the sample is heated to extract hydrogen and carbon in gaseous forms for conducting an analysis of the thus-extracted hydrogen and carbon, comprising

a tube including a bend adapted to receive and retain a solid sample placed in said tube when said bend is downwardly-directed and to discharge said sample from said tube when said bend is upwardly-directed;

means for rotating said tube about a longitudinal axis of said tube from a sample receiving and retaining position to a sample discharging position,

infrared heating means, and

means for focusing said infrared heating means on said tube so that when said tube is in said sample receiving and retaining position said infrared heating means is focused on said bend in said tube to heat said retained sample.

4,798,705

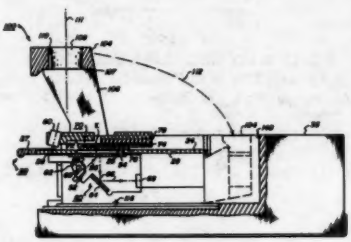
COMPACT ANALYZER

Raymond F. Jakubowicz, Rush, and John S. Larcher, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 813,286, Dec. 24, 1985, abandoned. This application Feb. 6, 1987, Ser. No. 13,223

Int. Cl.[4] G01N *27/26, 21/25*

U.S. Cl. 422—63 **9 Claims**



1. In an analyzer including a dispensing station and means for detecting a colorimetric or a potentiometric change in a test element on which a test liquid is dispensed at said dispensing station, said dispensing station including a pipette support for orienting a pipette to dispense the liquid at said dispensing station, said analyzer having an overall top surface;

the improvement wherein said analyzer further includes means for movingly connecting said pipette support to the analyzer to permit said support to move into and out of an operative position on said analyzer associated with said dispensing station, and out of and into, respectively, a withdrawn position in said analyzer, removed from said dispensing station;

and wherein said withdrawn support position is at or below said top surface, and said operative pipette support position is above said top surface,

so that when said pipette support is moved into the analyzer, the height of said analyzer is reduced compared to said height when said support is in said operative position.

4,798,706

DEVICE FOR HOLDING HORIZONTAL ARRAY OF LIQUID ALIQUOTS

David J. Brigati, Hummelstown, Pa., assignor to Fisher Scientific Co., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 775,864, Sep. 13, 1985, Pat. No. 4,731,335. This application Mar. 31, 1987, Ser. No. 32,875

Int. Cl.[4] C12M *1/18;* B01L *3/00*

U.S. Cl. 422—102 **11 Claims**

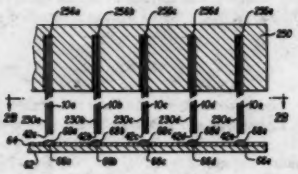
1. A device for holding a horizontal array of discrete aliquots of treating liquid consisting essentially of:

(a) a horizontally-extending rigid base,

(b) a horizontally-extending elastomeric member on the horizontally-extending rigid base, the elastomeric member having a substantially planar horizontally-extending upper surface, and

(c) a plurality of recesses formed in the elastomeric member, each recess being sized to receive internally only microliter quantities of a treating liquid and opening to the horizontally-extending upper surface, the elastomeric member having at its upper surface a material sufficiently incom-

patible with an aqueous treating liquid for a discrete aliquot of treating liquid of small volume greater than the



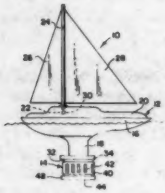
internal volume of a recess to form a convex shape extending from within a recess above the plane of the adjacent upper surface of the elastomeric member.

4,798,707

SAIL BOAT CHLORINE DISPENSER

Barry G. Thomas, 2308 E El Parque Dr., Tempe, Ariz. 85282, and George Spector, 233 Broadway, Rm 3815, New York, N.Y. 10007

Filed Apr. 9, 1987, Ser. No. 36,387
Int. Cl.[4] B01F *1/00*
U.S. Cl. 422—264 **2 Claims**



1. A chlorine dispenser comprising a sailboat in combination with dispensing means secured to said sailboat, said dispensing means comprising means responsive to sailboat movement through a fluid to adjust the rate of dispensing chlorine to predetermined areas of said dispenser, said means responsive to sailboat movement comprising:

(a) a partial cylindrical hollow housing with spaced longitudinal ends having a plurality of first vertical slots between said ends;

(b) a hollow sleeve mounted in said housing and rotatable therein and having a plurality of second vertical slots therethrough and a plurality of recesses on an outer peripheral surface therebetween whereby said recesses hold the chlorine therein; and

(c) a plurality of fins, each of said fins pivotable in one of said recesses in said sleeve, said fins spring biased to fan outwardly therefrom so as to catch water movement in a pool to rotate said sleeve until said fins are pushed backward into said recesses by said housing whereby chlorine is dispensed from said recesses when each fin is clear of said housing permitting outward pivotal fin movement.

4,798,708

PROCESS FOR RECOVERING CHROMIUM AND OTHER METAL VALUES FROM CHROMIUM BEARING MATERIAL

Judith A. Ladd, Sayre, and Michael J. Miller, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 16, 1988, Ser. No. 157,756
Int. Cl.[4] C01G *37/00*
U.S. Cl. 423—55 **12 Claims**

1. A process for recovering metal values from chromium bearing material comprising one or more metal values selected from the group consisting of cobalt, nickel, molybdenum, tungsten, iron, tin and aluminum, said process comprising:

(a) atomizing said material to produce a flowable powder;

(b) fusing said powder in an oxidizing atmosphere with a sufficient amount of an alkali metal hydroxide at a temperature sufficient to form a nonmagnetic fused material in which said chromium and any tungsten, or molybdenum contained therein are present as water soluble salts;

(c) slurrying said fused material with a sufficient amount of water to dissolve the water soluble compounds contained therein and form a leachate containing said soluble compounds;

(d) adjusting the pH of said leachate to from about 9.2 to about 9.6 with an acid to allow insolubles to form which contain any cobalt, and nickel which is present in said leachate and the major portion of any iron, tin and aluminum which is present in said leachate;

(e) separating said insolubles from the resulting first liquor;

(f) adjusting the pH of said first liquor to from about 0 to about 2 with an acid;

(g) adding to the resulting pH adjusted first liquor, methyl alcohol in an amount sufficient to reduce said chromium to the trivalent state;

(h) adding to the resulting methyl alcohol treated solution, activated carbon in an amount sufficient to form a carbon-containing suspension wherein essentially all of any molybdenum and tungsten contained therein are adsorbed by said carbon;

(i) separating said carbon with the adsorbed molybdenum and tungsten from the resulting chromium-containing second liquor;

(j) adjusting the pH of said second liquor to from about 5.0 to about 8.5 with a base to form a precipitate containing essentially all of said chromium; and

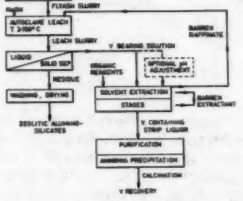
(k) separating said chromium containing-precipitate from the resulting spent liquor.

4,798,709

PROCESS FOR TREATMENT OF FLYASH

Valkuntam I. Lakshmanan, Mississauga; Dzinsars Melnbardis, Rexdale, and Robert A. Geisler, North York, all of Canada, assignors to Carbovan Inc., Mississauga, Canada

Filed Jun. 8, 1987, Ser. No. 59,363
Claims priority, application Canada, Sep. 8, 1986, 517717
Int. Cl.[4] C01G *31/00*
U.S. Cl. 423—63 **8 Claims**



1. A process for the recovery of vanadium from flyash and similar heat treated carbon-bearing vanadium containing particles, comprising the steps of:

(a) wetting of carbon bearing heat treated vanadium containing particles, then subjecting the wetted particles to a

physical separation step to yield a fine carbon product and a substantially carbon free aqueous slurry;

(b) leaching said slurry at over-atmospheric pressure in an aqueous alkali metal hydroxide solution of less than 5 moles per liter concentration, at temperatures between 110° to 300° C., to yield a vanadium-containing leach slurry comprising a vanadium-depleted residue;

(c) subjecting the leach slurry to liquid-solid separation to obtain a vanadium containing leach liquor and a vanadium depleted leach residue;

(d) contacting said leach liquor with an extractant in an organic solvent carrier, said extractant comprising at least a quaternary amine and an oxine derivative, and thereafter contacting said loaded organic solvent extractant with an aqueous solution to produce a vandium containing aqueous strip liquor and a substantially barren organic solvent extractant; and

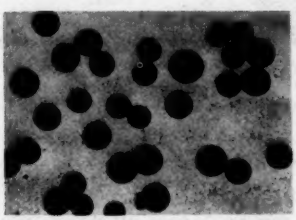
(e) recovering vanadium containing compounds from said vanadium containing strip liquor.

4,798,710

PROCESS FOR THE MANUFACTURE OF A POWDER FOR CERAMIC MATERIALS, CONTAINING AT LEAST ONE METAL OXIDE

Franz Legrand, Quaregnon, and Patricia De Bruycker, Brussels, both of Belgium, assignors to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Sep. 15, 1987, Ser. No. 96,526
Claims priority, application France, Sep. 15, 1986, 86 12968
Int. Cl.[4] C01G 25/02
U.S. Cl. 423—69 7 Claims



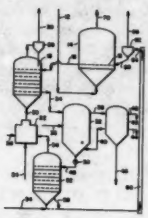
1. A process for the manufacture of a powder for ceramic materials, said powder containing at least one metal oxide, comprising the steps of treating an organic solution of at least one metal alcoholate with water under conditions adapted to precipitate at least one metal oxide as a powder, said step of treating including a first stage where a fraction of the quantity of water is added to the alcoholate with the resultant reaction mixture being subjected to maturing, and a second stage where the remainder of the quantity of water is added to the mixture; and collecting said powder, wherein the molar ratio of the quantity of water to the quantity of metal alcoholate employed is between about 0.5 and about 0.95 times the valency of the metal in the metal alcoholate.

4,798,711

PROCESSES FOR REMOVING NITROGEN OXIDES, SULFUR OXIDES AND HYDROGEN SULFIDE FROM GAS STREAMS

Lewis G. Neal, Danville, Calif.; John L. Haslbeck, Paducah, Ky., and Haiaopin Tseng, Kansas City, Mo., assignors to Noxso Corporation, Library, Pa.

Division of Ser. No. 905,138, Sep. 9, 1986, Pat. No. 4,755,499, which is a continuation of Ser. No. 659,996, Oct. 12, 1984, abandoned. This application Aug. 21, 1987, Ser. No. 88,121
Int. Cl.[4] B01D 53/02; B01J 8/00; C01B 21/00, 53/34
U.S. Cl. 423—239 8 Claims



1. A process for the removal of nitrogen oxides and/or sulfur oxides from a gas containing nitrogen oxides and /or sulfur oxides which comprises contacting said gas with a sorbent, said sorbent comprising:

(a) a gamma alumina substrate having a surface area between 100 m^2/g and 500 m^2/g and a pore volume between 0.4 and 0.8 cc/g, said gamma alumina substrate having a bimodal pore size distribution comprising micropores and macropores, said micropores having an average pore diameter d_1 in the range of between 30 and 400 Angstroms and said macropores having an average pore diameter d_2 in the range of between 80 and 3000 Angstroms,

(b) an alkali metal component, said substrate impregnated with said alkali metal component and the amount of said alkali metal component being between 50 and 400 μg per m^2 of said substrate.

4,798,712

HOMOGENEOUS MIXTURES OF POLYPHOSPHATES

John A. Peterson, Niagara Falls, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Mar. 4, 1985, Ser. No. 707,989
Int. Cl.[4] C01B 15/16, 25/26
U.S. Cl. 423—315 1 Claim

1. A process for preparing a homogenous, particulate mixture of sodium pyrophosphate and sodium tripolyphosphate, said process consisting essentially of the steps of:

(a) forming an aqueous solution of monosodium phosphate and disodium phosphate having a sodium to phosphorus mole ratio in the range of from 5:3 to 6:3,

(b) flash drying the solution at a temperature in the range of from about 150° C. to about 250° C. to form phosphate particles,

(c) calcining the dried particles at a temperature of from about 350° C. to about 550° C. to convert monosodium phosphate and disodium phosphate particles into homogenous polyphosphate particles, and

(d) recovering said homogenous polyphosphate particles, said particles containing from about 75% to about 85% by weight of sodium pyrophosphate and from about 15% to about 25% by weight of sodium tripolyphosphate.

4,798,713

METHOD OF SELECTIVE REDUCTION OF HALODISILANES WITH ALKYLTIN HYDRIDES

John J. D'Errico, Fenton, and Kenneth G. Sharp, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 28, 1987, Ser. No. 138,620
Int. Cl.[4] C01B 33/08
U.S. Cl. 423—342 18 Claims

1. A method of reduction of a silicon-halogen bond of a halodisilane to a silicon-hydrogen bond wherein each halogen of the halodisilane is independently selected from the group consisting of fluorine, chlorine, bromine, and iodine, and wherein when there are two or more different halogens present, the halogen with the highest atomic weight is preferentially reduced by contacting said halodisilane with a trialkyltin hydride or dialkyltin dihydride of the formula R_3SnH or R_2SnH_2, respectively, wherein R is an alkyl group containing 1 to 10 carbon atoms.

4,798,714

PROCESS FOR THE PREPARATION OF SILICON NITRIDE LOW IN CARBON CONTENT

Lothar Schönfelder, and Gerhard Franz, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,403
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, 3608352
Int. Cl.[4] C01B 21/063, 33/06
U.S. Cl. 423—344 8 Claims

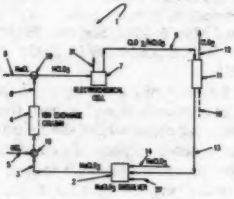
1. In the process for preparation of silicon nitride powder by treating silicon nitride powder with an atmosphere containing chlorine gas, the improvement comprises treating silicon nitride powder with an atmosphere containing chlorine gas at temperatures from 600° to 1050° C. and subsequently treating said silicon nitride with an atmosphere containing gaseous oxygen.

4,798,715

PRODUCING CHLORINE DIOXIDE FROM CHLORATE SALT

Kenneth L. Hardee, Middlefield, and Anthony R. Sacco, Mentor, both of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed Feb. 5, 1988, Ser. No. 152,709
Int. Cl.[4] C01B 11/02
U.S. Cl. 423—478 16 Claims



1. The method of producing chlorine dioxide, whereby said chlorine dioxide is provided from a soluble chlorate salt, which method comprises:

(a) establishing a solution of said chlorate salt in aqueous medium;

(b) providing an ion exchange zone including a cation exchanging resin reactable with the cation of said chlorate salt;

(c) feeding said aqueous solution of chlorate salt into the ion exchange zone and maintaining said salt within said zone for a time sufficient to react chlorate salt with cation exchange resin and produce chloric acid product;

(d) providing an electrochemical cell including an electrocatalytic cathode capable of converting chloric acid to chlorine dioxide;

(e) passing said chloric acid product from said ion exchange zone to said electrochemical cell; and

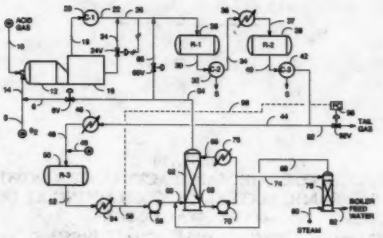
(f) electrochemically converting said chloric acid product in said cell, and thereby providing an aqueous solution containing chlorine dioxide.

4,798,716

SULFUR RECOVERY PLANT AND PROCESS USING OXYGEN

John W. Palm, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 857,009, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 605,498, Apr. 30, 1984, abandoned. This application Dec. 7, 1987, Ser. No. 134,574
Int. Cl.[4] C01B 17/04
U.S. Cl. 423—574 R 6 Claims



1. Process for the recovery of sulfur from a gaseous stream containing hydrogen sulfide, said process comprising the steps of:

(a) introducing a thermal reaction mixture comprising (1) said gaseous stream containing hydrogen sulfide, and (2) an oxygen-enriched stream of air or pure oxygen into a combustion zone of a Claus furnace;

(b) combusting said thermal reaction mixture in said Claus furnace to thereby produce hot combustion gases comprising hydrogen sulfide, sulfur dioxide, carbon dioxide, water, and elemental sulfur;

(c) introducing said hot combustion gases into a Claus catalytic reactor;

(d) subjecting said hot combustion gases in said catalytic reactor to Claus reaction conditions in the presence of a Claus catalyst to thereby produce a Claus plant gaseous effluent stream comprising hydrogen sulfide, sulfur dioxide, carbon dioxide, water, and elemental sulfur;

(e) introducing said Claus plant gaseous effluent into a condenser to thereby produce liquid sulfur, which is recovered, and a gaseous condenser effluent, which comprises hydrogen sulfide, sulfur dioxide, carbon dioxide and water;

(f) converting substantially all sulfur species in said gaseous condenser effluent to hydrogen sulfide, to thereby form a condenser effluent comprising hydrogen sulfide, carbon dioxide and water;

(g) removing water form the condenser effluent from step (f); and

(h) moderating the temperature in said Claus furnace by returning at least a portion of the dried condenser effluent from step (g), as a diluent stream, to a combustion zone of the Claus furnace in step (a) above.

4,798,717

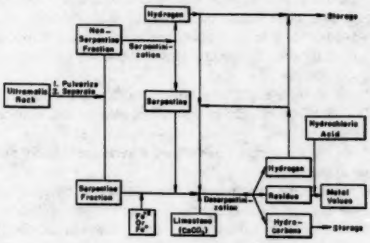
PRODUCTION OF ELEMENTS AND COMPOUNDS BY DESERPENTINIZATION OF ULTRAMAFIC ROCK

Maurice Morency, St-Lambert, Canada, assignor to Ultramafic Technology Inc., Kansas City, Mich.

Continuation-in-part of Ser. No. 886,696, Jul. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 775,283, Sep. 12, 1985, abandoned. This application Apr. 13, 1987, Ser. No. 35,620

Int. Cl.[4] C01B 3/02

U.S. Cl. 423—648.1 30 Claims



1. A process for forming hydrogen from comminuted ultramafic rock material comprising:

(a) contacting comminuted ultramafic rock material containing a substantial unserpentinized fraction and less than about 9 percent by weight structural water, with water at a temperature and pressure for a period of time to cause serpentinization of the unserpentinized fraction and consequent formation of serpentine and production of hydrogen; and

(b) subjecting the material treated in step (a) to a temperature and pressure for a period of time to cause deserpentinization and consequent formation of hydrogen and a solid residue.

4,798,718

METHOD OF PREPARING ACTIVE MAGNESIUM-HYDRIDE OF MAGNESIUM HYDROGEN-STORER SYSTEMS

Borislav Bogdanovic, Mülheim, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle, GmbH, Mulheim/Ruhr, Fed. Rep. of Germany

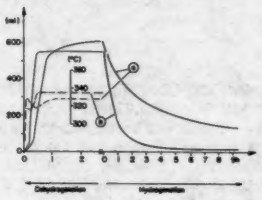
Division of Ser. No. 782,605, Sep. 30, 1985, which is a continuation of Ser. No. 548,055, Nov. 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 500,070, Jun. 1, 1983, Pat. No. 4,554,152, which is a continuation-in-part of Ser. No. 433,078, Oct. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 187,907, Sep. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 8,739, Feb. 2, 1979, abandoned. This application Mar. 27, 1987, Ser. No. 32,133

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247360

Int. Cl.[4] C01F 5/00

U.S. Cl. 423—647 19 Claims

1. Magnesium hydride which can reversibly give off and take up H_2, produced by contacting finely divided magnesium hydride with a solution of a transition metal organic compound, said transition metal being of Subgroups IV–VIII of the Periodic Table, and then removing the solution.



4,798,719

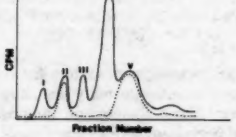
METHOD FOR SELECTION OF ANTIGENS SUITABLE AS IN VIVO TARGETS FOR ANTIBODIES

Byron T. Ballou, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Sep. 11, 1986, Ser. No. 906,161

Int. Cl.[4] A61K 49/02; G01N 33/53

U.S. Cl. 424—1.1 7 Claims



1. A process for the selection of antigens suitable as targets for antibodies which localize in tumors in animals in vivo comprising:

(a) preparing antibodies distinguishable from those present in the animal in which tumor targeting is to occur and that bind to antigens present in the tumor in said animal;

(b) injecting the prepared antibodies into a non-tumor-bearing animal and into a tumor-bearing animal to permit biofiltration of the antibodies;

(c) recovering the biofiltered antibodies from both the non-tumor-bearing animal and the tumor-bearing animal;

(d) identifying antigens whose antibodies are not retained in vivo in the non-tumor-bearing animal, but are retained in vivo in the tumor-bearing animal using the recovered biofiltered antibodies; and

(e) screening the antibodies that are not retained in vivo by the non-tumor-bearing animal and the antibodies that are not retained in vivo by the tumor-bearing animal to determine those antibodies that are actually retained in vivo in the tumor-bearing animal and to identify the antigens corresponding to those antibodies retained in the tumor-bearing animal.

4,798,720

NAIL POLISH DRYING COMPOSITION

William L. Holder, 341 Doverglen Dr., Antioch, Tenn. 37013

Filed Nov. 18, 1986, Ser. No. 932,089

Int. Cl.[4] A61K 7/043

U.S. Cl. 424—61 2 Claims

1. A nail coating composition,

said composition having a solid material comprising about

25% by weight of said composition and a solvent content comprising about 75% by weight of said composition, and said composition being a combination of a colorless nail polish, an acrylic nail powder, an acrylic nail primer and cyanoacrylate adhesive.

4,798,721

HAIR COSMETIC COMPOSITION COMPRISING SUBMICRON POLYMER PARTICLES

Kazuyuki Yahagi, Tokyo, and Toshio Suzuki, Ichikawa, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 2, 1986, Ser. No. 902,651
Claims priority, application Japan, Sep. 13, 1985, 60-202898
Int. Cl.[4] A61K *4/06, 7/09*
U.S. Cl. 424—70 10 Claims

1. A hair cosmetic composition comprising from 0.01 to 10% by wt. of a particulate latex polymer of water-insoluble monomers, said polymer selected from the group consisting of polystyrenes, copolymers of styrene with at least one vinyl monomer other than styrene, polyamides, polyurethanes, epoxy resins, and polymethyl methacrylates, wherein said particulate polymer has a weight average diameter of from 0.005 to 0.2 microns, particle size distribution such that greater than 95% by weight of the particles have a diameter ranging from 0.005 to 0.2 microns, and wherein said particulate ploymer has a glass transition temperature greater than 300 ® K.

4,798,722

PERMANENT WAVING COMPOSITION

Walter W. Edman, and Ernest J. Klemm, both of Westport, Conn., assignors to Zotos International, Inc., Darien, Conn.

Filed Nov. 12, 1986, Ser. No. 929,723
Int. Cl.[4] A61K *7/09*
U.S. Cl. 424—72 17 Claims

1. A permanent waving composition for providing longer lasting curl retention, manageability ease, and improved hair feel and appearance, said composition comprising, in addition to conventional permanent waving compounds formulated for breaking and rebonding the hair fibers' disulfide bonds, the following additives:

A. between about 0.001 and 2% by weight/volume of a strong hydrogen bonding amino acid compound
   a. formed from hydrolyzed silk protein, and
   b. having a mean molecular weight which enables the molecules to penetrate the cuticle in undamaged hair and enter the matrix in the cortex area of the hair fiber, and

B. between about 0.001 and 2% by weight/volume of a water soluble or emulsifiable silicone-based compound.

4,798,723

AGRICULTURAL PRODUCTS FROM *PSEUDOMONAS CEPACIA* STRAINS AND METHODS OF PREPARATION

Peter J. Dart, Fadden, and K. Prakash Hebbar, Canberra, both of Australia, assignors to Lubrizol Genetics, Inc., Wickliffe, Ohio

Continuation of Ser. No. 891,212, Jul. 28, 1986, abandoned. This application Oct. 5, 1987, Ser. No. 106,986
Int. Cl.[4] A01N *63/00*
U.S. Cl. 424—93 22 Claims

1. A method of protecting a plant from disease caused by a fungus comprising inoculating said plant with a strain of *Pseudomonas cepacia* type Wisconsin.

10. A bacteria-containing agricultural inoculum suitable for inoculating a plant in the field comprising:

(a) a suitable carrier that is non-phytotoxic, non-bacteriostatic and non-bacteriocidal; and

(b) a bacterial strain having the distinguishing characteristics of *Pseudomonas cepacia* type Wisconsin, which strain colonizes leaves or roots of said plant.

4,798,724

SOLID, STABLE DOSAGE FORMS WITH AN ELASTIC FILM COATING

Satish C. Khanna, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,772
Claims priority, application Switzerland, Jun. 24, 1985, 2664/85
Int. Cl.[4] A01N *25/10*; A61K *31/78*
U.S. Cl. 424—480 8 Claims

1. A solid, stable dosage form consisting of a core and an elastic film coating on said core, said core comprising at least one medicament and at least one pharmaceutically acceptable excipient, said core being moisture- or temperature- or both moisture- and temperature-sensitive; said elastic film coating being a coating which decomposes in aqueous solution, which coating comprises

(a) 20–60% by weight of a water soluble component,

(b) 25.5–80% by weight of a water-insoluble, but dispersable component, and

(c) 0.54–5% by weight of further pharmaceutically acceptable adjuvants,

said water soluble component consisting of hydroxypropyl cellulose having an average molecular weight of 75,000; said water-insoluble, but dispersable component consisting of

(I) 5–20% by weight, based upon the total film coating, of an acrylic resin selected from
   (A) a 70:30 ethyl acrylate/methyl methacrylate copolymer having a molecular weight of 80,000 and
   (B) a 30:70–70:30 methyl acrylate/methyl methacrylate copolymer having an average molecular weight of 500,000;

(II) 20–60% by weight, based on the total film coating, of a pharmaceutically acceptable lubricant;

(III) 0.5–5% by weight, based on the total film coating, of a pharmaceutically acceptable wetting agent; and

(IV) 0–5% by weight, based on the total film coating, of a pharmaceutically acceptable plasticiser.

4,798,725

SUSTAINED RELEASE CAPSULE

Vikram S. Patel, Norwich, N.Y., assignor to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,732
Int. Cl.[4] A61K *9/64*
U.S. Cl. 424—456 14 Claims

1. A sustained release pharmaceutical capsule for oral administration comprising a particulate mixture, in a capsule shell which is soluble in a gastrointestinal juice, said particulate mixture comprising:

(a) from about 0.01% to about 90% of an active drug ingredient which is a weak acid, neutral, or a weak base;

(b) from about 5% to about 96% of polyvinylpyrrolidone; and

(c) from about 4% to about 40% of carboxyvinylpolymer; wherein said polyvinylpyrrolidone and said carboxyvinylpolymer occur substantially entirely in separate particles of said particulate mixture.

4,798,726

PROCESS FOR THE TREATMENT OF MILK FOR CHEESEMAKING

Gilles Lagarde, Paris, France, assignor to Sanofi, Paris, France

Filed May 8, 1987, Ser. No. 47,259
Claims priority, application France, May 15, 1986, 86 07002
Int. Cl.[4] A23C *19/032, 19/05*
U.S. Cl. 426—40 7 Claims

1. In a process for making cheese from milk which includes the steps of rennet addition, coagulation, draining and ripening, wherein the improvement comprises accelerating ripening by adding to milk, prior to adding rennet, an amount of protoplasts of cheese ripening bacteria which are sufficient to accel-

erate cheese ripening as compared to ripening with corresponding bacteria containing cell walls.

4,798,727

SOLID ANIMAL FEED SUPPLEMENT AND METHOD FOR ITS PRODUCTION

Alex E. Miller, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 7, 1986, Ser. No. 828,149
Int. Cl.[4] A23K 1/22
U.S. Cl. 426—69 17 Claims

1. A method for providing a solid, molasses-based animal feed supplement having a hardness of less tahn about 80 in 0.1 millimeter penetrometer units and a phosphorus content between 1 and 2 percent by weight, which comprises:

(a) adjusting the phosphorus content of a molasses seleted from the group consisting of cane molasses and beet molasses and havign a BRIX of at least 75° by combining said molasses with a concentrated orthophosphoric acid solution to provide a first molasses solution comprising phosphorus in an amount sufficient to provide from 1 to 2 weight percent phosphorus in the solid feed supplement;

(b) then combining under conditions of agitation (i) from about ¼ to about 3 volumes of a second molasses solution comprising calcium chloride dissolved in a molasses selected from the group consisting of cane molasses and beet molasses with (ii) I volume of said first molasses solution, magnesium chloride being dissolved in the first and second solutions, to provide a reactant solution having a pH within the range from about 1.75 to about 3.75 except when the amount of added dissolved magnesium is less than 1.5 weight percent, the pH is from about 2.75 to about 3.75 the phosphorus, dissolved magnesium, and dissolved calcium present in said first and second solutions being sufficient in concentrations such that said reactant solution comprises from 1 to 2 percent by weight phosphorus, 0.5 to 2 percent by weight of dissolved magnesium, and as sufficient amount of dissolved calcium so that the weight ratio of the total weight of dissolved calcium to the the weight of dissolved magnesium in said reactant solution is between about 1.5 and 3;

(c) terminating said agitation;

(d) then curing said reactant solution at a temperature of from about 60° to about 110° F. for a sufficient time to form a solid, molasses-based animal feed supplement having a hardness of less than about 80 in 0.1 millimeter penetrometer units; and

(e) recovering the solid, molasses-based animal feed supplement.

4,798,728

METHOD OF RETORT PACKAGING BROILED FISH AND PRODUCT THEREOF

Ko Sugisawa; Yasushi Matsumura, both of Nara; Hidefumi Okamoto, Osaka, and Kumiko Abe, Nara, all of Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan

Filed Mar. 26, 1987, Ser. No. 30,348
Claims priority, application Japan, Mar. 26, 1986, 61-44516[U]
Int. Cl.[4] B65D 81/34; A23L 3/00; B65B 55/04; A23B 4/00
U.S. Cl. 426—129 6 Claims

1. A sterilized vacuumized retort package containing broiled fish selected from the group consisting of sardine, horse mackerel, pacific saury, mackerel, salmon, yellowtail, spanish mackerel, herring, eel, conger eel, flatfish, sea beam, and pollack, the meat of said broiled fish having a hardness of 105 g to 1250 g, said package made of a flexible material in which said broiled fish is received, said broiled fish being vacuum-packaged such that the flexible material substantially conforms to the shape of the fish and then subjected to retort sterilization processing, said broiled fish thereby being packaged in said package with a very high degree of adhesion, with substantial prevention of breakage of the fish body and separation of the epidermis during retort sterilization and subsequent transportation, with substantial elimination of the formation of drips and hardening of the meat during sterilization, and being of excellent quality and appearance.

4,798,729

METHOD FOR DELAYING *CLOSTRIDIUM BOTULINUM* GROWTH IN FISH AND POULTRY

Robert J. Anders, Middleton; John G. Cerveny, and Andrew L. Milkowski, both of Madison, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Continuation of Ser. No. 808,319, Dec. 12, 1985, abandoned.
This application Nov. 13, 1987, Ser. No. 120,769
Int. Cl.[4] A23B 4/14
U.S. Cl. 426—326 11 Claims

1. A method for delaying *Clostridium botulinum* growth in a foodstuff selected from the group consisting of fish and poultry, the method consisting essentially of:

(a) adding a lactate slat to a fresh foodstuff selected from the group consisting of fish and poultry, said lactate salt being added in an amount of about 1% to about 7%;

(b) cooking the foodstuff at high humidity to a temperature sufficient to cook the foodstuff but not sufficient to sterilize the foodstuff;

(c) cooling the cooked foodstuff; and

(d) packaging the cooked foodstuff in a plastic barrier package.

4,798,730

HYDROLYSIS OF A PARTIALLY EXTRACTED ROASTED AND GROUND COFFEE

Eugene Scoville, East Brunswick; Evan J. Turek, Paramus, both of N.J.; Anthony Wragg, Banbury, England; Karlina D. Cuozzo, Cliffside Park, and Marshall M. Rankowitz, Englishtown, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

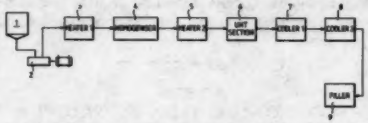
Filed Jun. 1, 1987, Ser. No. 57,190
Int. Cl.[4] A23F 5/26
U.S. Cl. 426—432 10 Claims

1. A method of solubilizing a partially extracted roasted and ground coffee, said coffee having a majority of the arabinogalactan extracted therefrom, which comprises:

contacting said partially extracted roasted and ground coffee with water at a temperature of about 380° F. to about 450° F. in a fixed bed reactor for a period of time such that the partially extracted roast and ground coffee residence time in the reactor is about 30 minutes to about 120 minutes and extract residence time in the reactor is about 7 minutes to about 45 minutes, said extract residence time being at all times significantly less than said coffee residence time to minimize degradation of soluble solids, the ratio of extract to coffee, the draw off factor, being at least 6, the superficial velocity of the extract as it flows through the coffee in the reactor ranging from 0.50 to 1.5, pressure being maintained within the reactor such that the water within the reactor does not flash,

said contact being effective to achieve hydrolysis of said partially extracted roasted and ground coffee and effective to remove at least 50% of the mannan fraction, and effective to achieve a soluble solids yield of about 55% to about 68% by weight based on the starting roasted and ground coffee.

4,798,731
HEAT TREATMENT OF FRESH LIQUID MILK PRODUCTS
Heva M. P. Ranjith, and Yin C. Theo, both of Telford, England, assignors to Milk Marketing Board, Surrey, England
Filed Sep. 3, 1985, Ser. No. 771,671
Claims priority, application United Kingdom, Sep. 3, 1984, 8422212
Int. Cl.[4] A23C 3/02
U.S. Cl. 426—522 16 Claims



1. A ultra-high temperature treatment process for the production of a liquid milk product whereby said milk product is substantially free from micro-organisms that would bring about spoilage during storage of the untreated product at 10° to 30° C., which process comprises the steps of
(a) heating a liquid milk product to a temperature not exceeding 105° C.,
(b) cooling said liquid milk product at a rate of at least 4.8° C. per second to a temperature above 105° C. and
(c) cooling said liquid milk product at a rate of at least 8.8° C. per second to a temperature below 110° C., the total time that said liquid milk product spends above 105° C. being such that the B* value of the complete heat treatment regime is not more than 1.01 and not less than about 0.5 and the C* value of the complete heat treatment regime is not more than 0.27.

4,798,732
METHOD OF STABILIZING COFFEE EXTRACT SOLUTION
Hide Osawa, Tokyo, Japan, assignor to Ajinomoto General Foods, Inc., Tokyo, Japan
Filed Nov. 12, 1987, Ser. No. 119,945
Int. Cl.[4] A23F 5/24
U.S. Cl. 426—542 4 Claims

1. A method of stabilizing a coffee extraction solution or a concentrated coffee extract solution which comprises adding to said concentrated and/or coffee extract solution, 0.005 to 20 weight percent of said solids content of said coffee extract solution in an anti-oxidizing substance obtained by extraction for about 5 to 30 minutes of an organic solvent defatted powdered raw coffee beans having an average particle diameter of 100 microns or less with a solvent consisting of hot water, the amount of hot water being five to thirty times by weight of the organic solvent defatted powdered raw coffee beans.

4,798,733
YEAST-FERMENTED FOOD MODIFIER
Tomiatsu Kaneko, Ichikawa; Kazuaki Yokoyama, Inba, and Hisashi Tsuruoka, Narashino, all of Japan, assignors to Miyoshi Oil & Fat Co., Ltd., Tokyo, Japan
Filed Apr. 1, 1987, Ser. No. 33,545
Claims priority, application Japan, Jul. 31, 1986, 61-180940
Int. Cl.[4] A21P 2/00
U.S. Cl. 426—549 8 Claims

1. A modifier for yeast-fermented foods comprising:
(a) 1 part by weight protein,
(b) 0.5 to 4 parts by weight of a first material selected from the group consisting of edible fats, oils and mixtures thereof,
(c) 3.5 to 13 parts by weight of water,
(d) 0.5 to 2 parts by weight of a second material selected from the group consisting of mashed potato powder, sweet potato powder and starches, and
(e) a third material selected from the group consisting of phosphates, cirtrates and mixtures thereof, said material being present in a range of 0.3 to 4.5% by weight based on the total weight of said protein, first material, water, and said second material.

4,798,734
PROCESS FOR PREPARING SOYBEAN FOOD PRODUCTS
Kichizo Kaneda, Kyoto, Japan, assignor to K. Biological Science Laboratory Co., Ltd., Kyoto, Japan
Continuation-in-part of Ser. No. 815,787, Jan. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 675,063, Nov. 26, 1984, abandoned. This application Jan. 16, 1987, Ser. No. 9,039
Claims priority, application Japan, Jul. 25, 1984, 59-153228
Int. Cl.[4] A23C 11/10; A23J 1/14
U.S. Cl. 426—565 2 Claims

1. A process for preparing a soybean-based frozen dessert, which comprises:
mixing 93.49–68.49% by weight of soybean aqueous infusion, 0.3% by weight of soy cellulose and 5–30% by weight of vegetable oil;
adding 0.2% by weight of alginic acid derivative, 0.1% by weight of sucrose fatty acid ester, 0.3% by weight of sucrose, 0.01% by weight of sodium polyphosphate, 0.3% by weight of anti-oxidant and 0.3% by weight of fruit brandy to the resultant mixture;
stirring the thus obtained mixture at a temperature not higher than 8° C. and cold-homogenizing at a pressure of 5–10K/cm^2 to obtain an emulsion;
aging the emulsion at a temperature not higher than 10° C. for 8–10 hours; and
freezing the aged emulsion at a temperature of about −20 C.

4,798,735
FOODSTUFFS CONTAINING STARCH OF AN AMYLOSE EXTENDER SUGARY-2 GENOTYPE
Robert B. Friedman, Chicago, Ill.; David J. Gottneid, Griffith, Ind.; Eugene J. Faron, Schererville, Ind.; Frank J. Pustek, Munster, Ind., and Frances R. Katz, Crown Point, Ind., assignors to American Maize-Products Company, Stamford, Conn.
Filed Jul. 2, 1987, Ser. No. 69,265
Int. Cl.[4] A23L 1/04, 1/195
U.S. Cl. 426—578 9 Claims

1. A thickened foodstuff for canning comprising a foodstuff, water and having as an essential ingredient therein an effective amount of a natural thin-thick starch, said starch extracted from a starch bearing plant having an amylose extender sugary-2 genotype, said starch providing no effective thickening characteristics to said foodstuff before canning while providing effective thickening characteristics to said foodstuff after canning.

4,798,736
PROCESS AND PRODUCT OF MAKING A VEGETABLE PROTEIN HYDROLYSATE FOOD SEASONING
Lothar Belohlawek, Freising, Fed. Rep. of Germany, assignor to Diamalt Aktiengesellschaft, Munich, Fed. Rep. of Germany
PCT No. PCT/DE86/00477, § 371 Date Jul. 22, 1987, § 102(e) Date Jul. 22, 1987, PCT Pub. No. WO87/03174, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 22, 1986, Ser. No. 89,365
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541802
Int. Cl.[4] A23J 1/12; A23L 1/237
U.S. Cl. 426—656 20 Claims

1. A dietetic food seasoning, comprising a vegetable protein hydrolysate preparable by hyrolyzing vegetable protein with 2

to 7.5 times its amount by weight of 15–30% by weight aqueous hydrochloric acid or phosphoric acid at 100° C. to 120° C.,

neutralizing the hydrolysate with 30–60% by weight aqueous potassium hydroxide solution until a pH value of 4–6.8 is reached,

allowing the neutralized hydrolysate to stand for at least two hours at 10° C. to 30° C., at a hydrolysate volume of 1.2 to 2.8 liters per kilogram of vegetable protein used whereby potassium salt precipitates, and then

filtering the neutralized hydrolysate.

4,798,737

PELLETIZATION OF LOW-TITER LIPIDS

Ellis W. Brunton; Denver J. Haynes, both of Wilkesboro, and William M. Ross, Jr., Moravian Falls, all of N.C., assignors to Balanced Energy Company, Wilkesboro, N.C.

Filed Apr. 7, 1987, Ser. No. 35,609

Int. Cl.[4] A23D *3/00*

U.S. Cl. 426—602 **29 Claims**

1. In a method of forming solid pellets from low-titer lipids which are generally liquid or semisolid at room temperature, wherein an emulsion is formed of a coagulant present in an amount effective to induce coagulation in the presence of a hardening agent, water and a lipid, and the emulsion is then separated into discrete portions and the discrete portions are hardened by exposure to the hardening agent; the improvement comprising forming the emulsion by first admixing the coagulant and the lipid to form a suspension of the coagulant in the lipid; and then admixing the suspension with water.

4,798,738

MICRO SENSOR

Masao Yafuso, El Toro, Calif., and Henry K. Hui, Irvine, Calif., assignors to Cardiovascular Devices, Inc., Irvine, Calif.

Filed Oct. 10, 1986, Ser. No. 917,913

Int. Cl.[4] A61R *49/00*; B05D *5/06*

U.S. Cl. 427—2 **24 Claims**

1. A process of forming a micro sensor which comprises:

selecting a quantity of finely divided water insoluble ionic permeable hydrophylic polymer having a plurality of attachment sites thereon;

reacting said attachment sites on said polymer with a quantity of an event sensitive dye so as to attach said dye to at least some of said attachment sites on said polymer to form a dye bearing polymer;

dissolving said dye bearing polymer in a solvent;

depositing a quantity of said solvated dye bearing polymer onto an optical fiber; and

regenerating said dye bearing polymer from said solvent to form a solid matrix on said optical fiber of said regenerated dye bearing polymer.

4,798,739

PLASMA-ASSISTED METHOD FOR THIN FILM FABRICATION

Jacques Schmitt, La Ville Du Bois, France, assignor to Solems, Palaiseau, France

Filed Oct. 21, 1986, Ser. No. 921,072

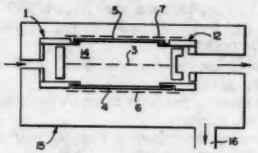
Claims priority, application France, Oct. 25, 1985, 85 15910

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 **1 Claim**

1. Process of forming thin films by means of a plasma assisted chemical deposit of the type having a non-airtight tank in which is enclosed at least one reagent gas, at least one substratum in the form of a support plate for the thin films, and at least one polarized plasma-generating electrode, the process comprising the steps of:

placing the tank inside an airtight chamber; and



maintaining lower pressure in the airtight chamber than in the tank wherein the reagent gas circulates.

4,798,740

POLYMERIZABLE FILM AND PATTERN FORMING METHOD BY USE THEREOF

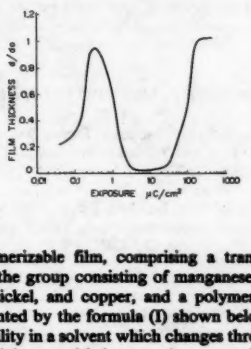
Yoshinori Tomida, Atsugi; Kunihiro Sakai, Yamato; Hiroshi Matsuda, Atsugi; Haruki Kawada, Atsugi; Ken Eguchi, Atsugi; Toshiaki Kimura, Sagamihara; Kiyoshi Takimoto, Atsugi; Kenji Saitoh, Yokohama, and Toshihiko Miyazaki, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,364

Claims priority, application Japan, Mar. 31, 1986, 61-73111; Mar. 31, 1986, 61-73112; Apr. 3, 1986, 61-77023

Int. Cl.[4] B05D *3/06*; G03C *1/76, 1/71*

U.S. Cl. 427—43.1 **47 Claims**



12. A polymerizable film, comprising a transition metal selected from the group consisting of manganese, chromium, iron, cobalt, nickel, and copper, and a polymerizable compound represented by the formula (I) shown below, and also having a solubility in a solvent which changes through a maximum and a minimum with increase in energy imparted for polymerization:

$$R—C{\equiv}C—C{\equiv}C—(R_1)_n—X \quad (I)$$

wherein R and R_1 are hydrophobic sites, X is a hydrophilic site, and n is 0 or 1.

42. A method of forming a pattern comprising providing on a substrate an intermediate layer and a layer comprising a monomolecular film of a polymerizable compound containing a transition metal or a built-up film thereof, the compound having a solubility in solvent which changes repeatedly through a soluble state and an insoluble state with increase in energy imparted, and imparting variations in energy to the layer to form a first insoluble site and a second soluble site.

4,798,741

PREPARATION OF MICROENCAPSULATED PIGMENT

Jeffrey W. Nelson, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 808,462, Dec. 13, 1985. This application Dec. 15, 1986, Ser. No. 941,793

Int. Cl.[4] B01J 13/02; B05D 3/10; C09C 1/56

U.S. Cl. 427—213.33 5 Claims

1. A process for the preparation of a microencapsulated pigment comprising:

A. mixing pigment particles having a particle size of 20 μm or less in a gelatin solution,

B. coacervating the gelatin to coat the pigment particles,

C. cooling to set the gelatin,

D. adding formaldehyde to harden the particles,

E. sequestering unreacted formaldehyde with a bisulfite,

F. adding gelatin to coat the hardened particles,

G. precipitating the particles chemically or physically, and

H. washing the precipitate.

4,798,742

POLYAROMATICS

Denis G. H. Ballard, Runcorn; Paul A. Holmes, Malpas; Alan Nevin, Nr Warrington; Ian M. Shirley, Weaverham, and David L. Twose, Tarporley, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 20, 1987, Ser. No. 39,735

Claims priority, application United Kingdom, Apr. 23, 1986, 8609936

Int. Cl.[4] B05D 3/12, 3/02

U.S. Cl. 427—240 10 Claims

1. A process for the preparation of a polyphenylene layer which process comprises at least the steps of:

(a) heating a solution of a poly(1,2-disubstituted-cyclohexa-3,5diene) in a suitable solvent therefor under first conditions such that a portion of the cyclohexene rings are aromatized:

(b) depositing a layer of the partially aromatized solution intermediate from step A onto a suitable substrate; and then

(c) treating the aforesaid layer under second conditions such that the residual cyclohexene rings are aromatized.

4,798,743

VAPOR DEPOSITION METHOD FOR THE GAAS THIN FILM

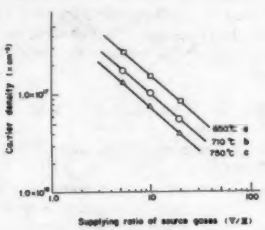
Seiji Kojima, Tokyo; Masakiyo Ikeda, Yokohama; Hiroshi Kikuchi, Tokyo, and Yuzo Kashiwayanagi, Yokosuka, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,187

Claims priority, application Japan, May 16, 1985, 60-104626

Int. Cl.[4] C23C 16/30

U.S. Cl. 427—255 4 Claims



1. A metal organic chemical vapor deposition method for the production of an n-type GaAs thin film, comprising the steps of

(i) supplying arsenic hydride gas and organic gallium gas to a heated substrate, wherein the supplying ratio of said gases is sufficient to produce a p-type conductive GaAs crystal, and

(ii) adding a gas comprising a compound of a group VI element to said arsenic hydride and said organic gallium gas to produce said n-type film, whereby said group VI element becomes a dopant in said n-type GaAs thin film, and

wherein said thin film has a carrier density of not less than $1\times10^{16}cm^{-3}$.

4,798,744

FIXATION OF POLYMERS RETAINING LIQUIDS IN A POROUS STRUCTURE

Guy Goldstein, Colmar, and Michel Pierre, Mulhouse, both of France, assignors to Beghin-Say S.A., Thumeries, France

PCT No. PCT/FR86/00257, § 371 Date Mar. 23, 1987, § 102(e) Date Mar. 23, 1987, PCT Pub. No. WO87/00438, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 22, 1986, Ser. No. 44,500

Claims priority, application France, Jul. 23, 1985, 85 11256

Int. Cl.[4] B05D 3/02

U.S. Cl. 427—389.9 6 Claims

1. A process for the deposition and fixation of insoluble hydrophilic polymers in or on a porous support, said polymers being obtained according to a "water-in-oil" reverse emulsion or suspension process comprising impregnating the porous support with said reverse emulsion in the liquid state as it is recovered from the polymerization reaction, and thereafter removing the suspending solvent from the support.

4,798,745

NON-YELLOWING COATING COMPOSITION BASED ON A HYDROXY COMPONENT AND AN ANHYDRIDE COMPONENT AND UTILIZATION IN A PROCESS OF COATING

Jonathan T. Martz, Glenshaw; James B. O'Dwyer, Valencia; Stephen J. Thomas, Aspinwall, and James A. Claar, Export, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 24, 1987, Ser. No. 88,327

Int. Cl.[4] B05D 1/36, 7/00; C08L 35/00, 33/14

U.S. Cl. 427—407.1 25 Claims

14. A method of coating comprising the steps of:

(I) coating a substrate with one or more applications of a pigmented basecoating composition to form a basecoat; and

(II) coating said basecoat with one or more applications of a transparent topcoating composition to form a transparent topcoat; wherein at least one application of said basecoating composition and said topcoating composition is a non-yellowing coating composition comprising

(A) a hydroxy component having at least two free hydroxyl groups per molecule; and

(B) an anhydride component having at least two carboxylic acid anhydride groups per molecule derived from a mixture of monomers comprising greater than or equal to 11 percent by weight of an ethylenically unsaturated carboxylic acid anhydride the balance of said mixture comprised of at least one vinyl comonomer, the molar ratio of said vinyl comonomer to said carboxylic acid anhydride being at least 1.0:1.0 and sufficient to provide a color standard number of less than 150 according to ANSI/ASTM test method D 1209-69 when an amount of component (B) sufficient to provide 27 grams of solids of said component is mixed with 1.0 gram of dimethylcocoamine and reduced with butyl acetate to a solids content of 22.5 percent by weight;

wherein the amounts of said hydroxy component and said anhydride component in said non-yellowing coating composition provide a ratio of equivalents of hydroxyl groups to equivalents of anhydride groups in a range of from 3:1 to 1:3.

4,798,746

BASECOAT/CLEARCOAT METHOD OF COATING UTILIZING AN ANHYDRIDE ADDITIVE IN THE THERMOPLASTIC POLYMER-CONTAINING BASECOAT FOR IMPROVED REPAIRABILITY

James A. Claar, Export; Stephen J. Thomas, Aspinwall, and Betty J. Kindle, Oakmont, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 24, 1987, Ser. No. 88,328
Int. Cl.[4] B05D 1/36, 7/00; C08L 33/14, 35/00
U.S. Cl. 427—407.1 19 Claims

1. A method of coating comprising the steps of:

(I) coating a substrate with one or more applications of a pigmented basecoating composition comprising a thermoplastic, non-crosslinked, film-forming polymer having at least two functional groups per molecule which functional groups are co-reactive with acid anhydride moieties, to which basecoating composition has been added within 24 hours prior to coating said substrate, a carboxylic acid anhydride component having at least two cyclic anhydride groups in an amount so as to provide a ratio of equivalents of anhydride groups to equivalents of said co-reactive functional groups of at least 0.10:1.00

to form a basecoat; and

(II) coating said basecoat with one or more applications of a transparent, crosslinking topcoating composition comprising a crosslinkable, film-forming material and a crosslinking agent for said crosslinkable, film-forming material

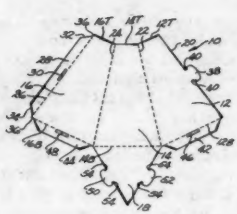
to form a transparent topcoat.

4,798,747

DISPOSABLE WARNING MARKER APPARATUS

Camille A. Laramee, 30 Andros Pl., Dania, Fla. 33004

Filed Oct. 13, 1987, Ser. No. 107,557
Int. Cl.[4] B65D 5/00
U.S. Cl. 428—12 5 Claims



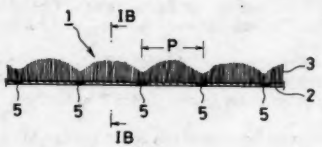
1. A semi-finished sheet for making disposable warning marker devices having first, second, and third essentially identical major panels, each major panel being trapezoidal in shape having parallel top and bottom portions, the second panel disposed intermediate the first and third panels, the first and third panels having inner and outer sides, a respective fold line separating the first and second panels and the second and third panels, the fold lines forming the respective inner sides, a locking tab projecting outwardly from the outer side of the first panel, a closure flap extending outwardly from the third panel, a slot formed in the closure panel along the outer portion of the third panel, the locking tab and the slot disposed the same distances from the top portion of the respective panel to which the tab and slot is associated, a minor panel extending outwardly from the bottom portion of the second panel, the minor panel being triangular in shape and having first and second free side portions, a fold line separating the minor panel from the second panel, a respective closure flap extending outwardly from the bottom portions of the first and second panels, a slot formed in each closure flap extending form the bottom portion a selected distance from the second panel, a locking tab projecting outwardly from each of the first and second free sides the selected distance from the second panel whereby the locking tab projecting from the first panel is lockably insertable in the slot formed in the closure flap extending from the third panel by folding the major panels on their respective fold lines and the locking tabs projecting from the free sides of the minor panel are lockably inserted in the respective slot formed in the closure flaps extending from the bottom portion of the first and second panels, each locking tab having a first portion with a length between first and second ends generally the same as the length of its respective slot and a second portion with a length greater than the length of its respective slot and extending beyond both first and second ends of the first portion, the second its respective panel being spaced from the first portion a distance generally equal to the thickness of the sheet.

4,798,748

ARTIFICIAL FUR

Hiroshi Kitamura, Kusatsu, and Seiichi Yamagata, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 10, 1986, Ser. No. 917,590
Claims priority, application Japan, Oct. 25, 1985, 60-237478; Oct. 25, 1985, 60-237479
Int. Cl.[4] A41D 5/00
U.S. Cl. 428—15 20 Claims



1. An artificial fur having an erect pile layer consisting of a number of erect fibers, wherein erect piles in different colors, which are substantially complementary with each other, are adjacent to each other in said erect pile layer said substantially complementary colored piles are colors which are selected from the group consisting of colors which are opposite each other, and either of the two colors which are adjacent to the opposite color, on a complementary color circle with a complimentary relationship as depicted by a color wheel having the colors, as viewed clockwise; yellow, green yellow, green, blue green, blue, purple blue (indigo), purple, red purple, red, yellow red.

4,798,749

ISOPENTANE AS BLOWING AGENT TO IMPROVE COFFEE RETENTION IN FOAM CUPS MOLDED FROM EXPANDABLE POLYSTRENE

Paul E. Arch, Wayne, and Edwin H. Niemann, Downington, both of Pa., assignors to Arco Chemical Company, Newtown Square, Pa.

Filed Apr. 25, 1988, Ser. No. 184,926
Int. Cl.[4] B65D 23/00
U.S. Cl. 428—36.5 1 Claim

1. A cup with enhanced coffee retention molded and foamed from a composition consisting of polystyrene particles having a blowing agent mixture consisting of of from 5 to 100 percent of isopentane and 0 to 95 percent of n-pentane.

4,798,750

RETORTABLE CONTAINERS WITH EXTERIOR MODIFIED POLYSTYRENE CAP LAYER

R. James Kersting, Houston, Tex., assignor to Rampart Packaging Inc., Williamsburg, Va.

Filed Oct. 29, 1987, Ser. No. 113,958
Int. Cl.[4] B65D 23/00; B37B 27/08
U.S. Cl. 428—36.7 6 Claims

1. A multilayer structure comprising:

(a) inner and outer layers of a polystyrene polymer modified with a carboxylic acid or a carboxylic anhydride; and
(b) an intermediate layer of an ethylene vinyl alcohol copolymer.

4,798,751

HEAT SHRINKABLE MULTILAYER FILM FOR PRIMAL MEAT PACKAGING

Jeffrey M. Schuetz, Woodridge, Ill., assignor to Viskase Corporation, Chicago, Ill.

Filed May 28, 1987, Ser. No. 54,920
Int. Cl.[4] B32B *27/08*; B65D *25/22*
U.S. Cl. 428—34.9 **30 Claims**

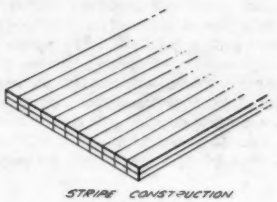
1. A heat-shrinkable, biaxially stretched multilayer film suitable for packaging primal and sub-primal meat cuts and processed meats, said film containing a barrier layer comprising a blend of vinylidene chloride-methyl acrylate copolymer and vinylidene chloride-vinyl chloride copolymer having between about 2.9 and about 13.5 weight percent methyl acrylate, and between about 2.9 and about 11.6 weight percent vinyl chloride in said blend.

4,798,752

CURABLE SHEET

Robert H. McLoughlin, and Pushpkumar D. Changani, both of Swindon, England, assignors to Raychem Limited, London, England

Continuation of Ser. No. 583,459, Feb. 24, 1984, abandoned.
This application Nov. 4, 1985, Ser. No. 794,911
Claims priority, application United Kingdom, Feb. 25, 1983, 8305312
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[4] B27N *5/02*; B32B *31/08*
U.S. Cl. 428—36 **16 Claims**



1. An assembly comprising (a) a heat-recoverable article and (b) a curable sheet comprising a plurality of discrete regions of each of at least two mutually reactive polymeric components which components are fusion bonded to each other at least at the mutual edge interfaces of their respective sheet regions in a substantially fixed spatial arrangement such that the said two components will react together to effect curing of the sheet when said heat-recoverable article is heat-recovered thereon.

4,798,753

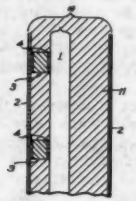
INSULATING PANELS CONTAINING INSULATING POWDERS AND INSULATING GASES

Nesim Abuaf, Schenectady, N.Y.; Robert W. Barito, and Kenneth L. Downs, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Continuation of Ser. No. 943,737, Dec. 19, 1986, abandoned.
This application Feb. 11, 1988, Ser. No. 157,156
Int. Cl.[4] B32B *1/02*, *9/00*
U.S. Cl. 428—69 **5 Claims**

1. A slab of material for use as a thermal insulation comprising:

a. a compressed, particulate insulating material selected from the group consisting of precipitated silica, mixtures of precipitated silica and fly ash materials, said precipitated silica formed by the interaction of an alkaline water glass and a mineral acid to precipitate silica, followed by a drying action to form a dried, finely divided silica;



b. a gas and water tight envelope surrounding said particulate insulating material; and
c. an insulating gas within said gas and water tight envelope, said gas impregnating said particulate material.

4,798,754

OIL-ABSORBENT FLOOR MAT

Lawrence S. Tomek, Drake Creekside Two No. 320, 2629 Redwing Rd., Ft. Collins, Colo. 80526

Filed Aug. 10, 1987, Ser. No. 85,721
Int. Cl.[4] F16N *31/00*
U.S. Cl. 428—74 **9 Claims**

1. An absorbent floor mat for absorbing oil and grease drippings beneath a motor vehicle comprising:

a generally rectangular base layer composed of a thin, flexible, oil-impervious material; and

a plurality of upper oil-absorbent flexible plies superimposed on said base layer including means for securing said plies to one another, said absorbent plies being composed of a cellulose wadding material, and means for securing a lowermost of said plies to an upper surface of said base layer, said absorbent plies being of generally rectangular configuration and having an area no greater than said base layer, said means for securing said absorbent layers to said base layer operative to secure said absorbent layers in centered relation to said base layer.

5. An absorbent floor mat according to claim 1, an upper layer disposed over said absorbent plies and having outer peripheral edges in sealed relation to outer peripheral edges of said base layer, said upper layer provided with openings at spaced intervals therein, and hold-down means for securing said mat to a surface beneath the motor vehicle.

4,798,755

MAGNETIC RECORDING MEDIUM

Yasuyuki Yamada, and Hajime Miyatsuka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 1, 1986, Ser. No. 857,872
Claims priority, application Japan, May 1, 1985, 60-92189; May 13, 1985, 60-99496
Int. Cl.[4] G11B *5/716*, *5/702*
U.S. Cl. 428—141 **13 Claims**

1. A magnetic recording medium comprising a non-magnetic support having provided on one side thereof a magnetic layer comprising a binder having dispersed therein fine ferromagnetic particles and on the other side thereof a backing layer,

wherein both said magnetic layer and said backing layer contain

(1) a vinyl chloride resin having —SO_3M groups, wherein M is selected from Li, Na, and K, and epoxy groups, and

(2) polyurethane as binders, wherein said vinyl chloride resin contains from 0.1 to 2.0% by weight —SO_3M groups, and from 0.2 to 10% by weight epoxy groups, based on the total weight of the resin; and wherein the weight of the fine ferromagnetic particles to the binder is in the range of from 100/13 to 100/45.

4,798,756

LAMINATE STRUCTURE OF INTERIOR FINISHING MATERIAL

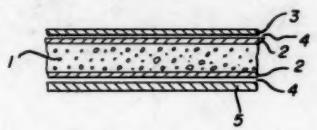
Shigeyoshi Fukushima; Hidehiro Uno, both of Nagoya, and Shigetoshi Mimura, Toyota, all of Japan, assignors to Toyo Tire & Rubber Company Limited, Osaka, Japan

Filed Jan. 4, 1988, Ser. No. 140,771

Claims priority, application Japan, Jan. 9, 1987, 62-2210[U]; Jan. 9, 1987, 62-2211[U]

Int. Cl.[4] B32B *7/04, 3/26, 17/00*

U.S. Cl. 428—198 2 Claims



1. A laminate structure of interior finishing material having suitable air permeability and sound absorbing properties, the laminate structure comprising a thermoplastic rigid polyurethane foam layer in the form of a platelike member, a reticular glass cloth layer provided on at least one surface of the foam layer, a nonwoven fabric layer provided on one surface of the assembly of the foam and cloth layers, and a facing layer provided on the other surface of the assembly, the fabric layer and the facing layer being individually provided on the different surfaces of the assembly and being adhered by heating to the assembly with a hotmelt adhesive film having a plurality of slits therein.

4,798,757

SOFT WATER-PERMEABLE POLYOLEFIN NONWOVENS HAVING OPAQUE CHARACTERISTICS

James P. Modrak, Rockdale County, and Owen P. Roberts, Franklin County, both of Ga., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jun. 22, 1987, Ser. No. 64,363

Int. Cl.[4] B32B *27/14*

U.S. Cl. 428—198 34 Claims

1. A polyolefin-containing nonwoven material comprising, in combination, at least one bonded fiber web, said nonwoven material containing not less than 25%, based on total web weight, of polyolefin filament having (a) a delta cross-sectional configuration, (b) and initial spun denier not exceeding about 4 dpf, and (c) a final drawn denier of not less than about 1 dpf.

4,798,758

FOAM GLASS HAVING CRUST LAYER AND METHOD OF PRODUCING SAME

Makoto Nagano; Akira Nakanishi, both of Takaishi; Tomoyoshi Hiraki, Osaka; Akira Ueno, Takaishi; Shoji Takahashi, Matsusaka; Shuhei Kobayashi, Tsu; Akihiro Yamamoto, Matsusaka, and Fumio Kodama, Ichikawa, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Mar. 9, 1987, Ser. No. 23,854

Claims priority, application Japan, Mar. 10, 1986, 61-50302; Mar. 11, 1986, 61-51536; Mar. 20, 1986, 61-60960

Int. Cl.[4] B32B *3/26, 9/00, 18/00*

U.S. Cl. 428—213 20 Claims

1. A foam glass comprising a foam layer consisting essentially of a glass selected from the group consisting of soda lime glass, borosilicate glass and aluminosilicate glass, and a crust layer which is unitary with the foam layer and covers at least one major surface of the foam layer, the crust layer consisting essentially of a glass selected from the group consisting of soda lime glass, borosilicate glass and aluminosilicate glass, and having an apparent specific gravity in the range from 0.8 to 1.7 and a thickness in the range from 1.5 to 20 mm, the the thickness of the crust layer being not more than ¼ of the whole thickness of the foam glass, wherein the difference between the apparent specific gravity of the foam layer is not more than 1.2.

4. A foam glass according to claim 1, wherein the total thickness of the foam layer and the crust layer is in the range from 30 to 125 mm.

4,798,759

MULTI-LAYER POLYESTER FILM FOR MAGNETIC TAPE

Hermann Dallman, Wiesbaden-Naurod; Hartmut Hensel, Schlangenbad, and Werner Schäfer, Hofheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,465

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610167

Int. Cl.[4] B32B *5/16, 27/36*

U.S. Cl. 428—220 17 Claims

1. A thin, coextruded, biaxially oriented multilayer film having a superior modulus of elasticity comprising

(i) a first polyester film layer whose surface roughness R_a is 0.010 micron or less;

(ii) a second polyester film layer whose surface roughness R_a is greater than 0.010 micron, said polyester film containing (a) from 0.01 to 1% by weight of particles having an average particle size of from 0.001 to five microns and (b) from 0.01 to 5 weight percent of a nucleating agent,

with the proviso that said film have a thickness not greater than 10 microns and yet has a modulus of elasticity in the machine direction of at least 6,500 N/mm^2.

4,798,760

SUPERIMPOSED WET PRESS FELT

Michelle A. Diaz-Kotti, Johnston, S.C., assignor to Asten Group, Inc., Charleston, S.C.

Filed Sep. 9, 1987, Ser. No. 94,703

Int. Cl.[4] B32B *5/02*

U.S. Cl. 428—234 15 Claims

8. A wet press felt comprising:

(a) a woven base fabric;

(b) a layer of a synthetic, polymeric resin netting having a mesh count per linear inch of between 4 and 64;

(c) said netting layer being contiguous with said base fabric; and

(d) a layer of batt material disposed upon said netting layer and affixed to both said netting layer and said base fabric.

4,798,761

EPOXY RESIN COMPOSITIONS FOR USE IN LOW TEMPERATURE CURING APPLICATIONS

Paul L. Wykowski, and Paul M. Puckett, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 3, 1987, Ser. No. 116,593
Int. Cl.[4] C08G 63/00
U.S. Cl. 428—272 24 Claims

1. A composition which comprises

(A) an epoxy resin composition containing, as the only epoxy-containing component in said composition, a mixture of

(1) at least one diglycidyl ether of a compound having 2 aromatic hydroxyl groups per molecule, said diglycidyl ether having an average of not more than 2 vicinal epoxy groups per molecule and an EEW of from about 170 to about 600;

(2) at least one polyglycidyl ether of a compound having an average of more than two aromatic hydroxyl groups per molecule, said polyglycidyl ether having an EEW of from about 150 to about 350; and

(3) a rubber or elastomer;

wherein components (1) and (2) are employed in amounts such that from about 20 to about 90 percent of the glycidyl ether groups are derived from component (1) and from about 10 to about 80 percent of the glycidyl ether groups are derived from component (2) and component (3) is employed in an amount of from 2 to about 20 percent by weight based on the combined weight of components (1), (2) and (3); and

(B) optionally, as a reactive diluent to lower the viscosity of the composition, a low viscosity monoglycidyl ether compound or a low viscosity polyglycidyl ether of a compound having two or more aliphatic hydroxyl groups per molecule; and

wherein component (B) is employed in an amount of from zero to about 25 percent by weight based on the combined weight of components (A) and (B).

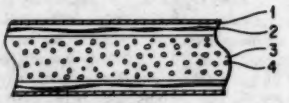
4,798,762

LAMINATE BOARD CONTAINING UNIFORMLY DISTRIBUTED FILLER PARTICLES AND METHOD FOR PRODUCING THE SAME

Reisuke Okada, and Hisami Fujino, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 765,476, Aug. 14, 1985, Pat. No. 4,661,301.
This application Jan. 20, 1987, Ser. No. 4,722
Int. Cl.[4] B32B 15/04, 5/00
U.S. Cl. 428—285 3 Claims

1. A copper clad laminate board for a printed circuit, having a thickness from 0.5 to 1.6 mm, comprising a center plate which consists of a thermosetting resin and hollow glass microspheres, uniformly distributed in said resin, the volume fraction of which ranges from 0.5 to 0.7, based upon the volume of the center plate, and sheets, provided on both sides of said center plate, which comprise a thermosetting resin and a reinforcing



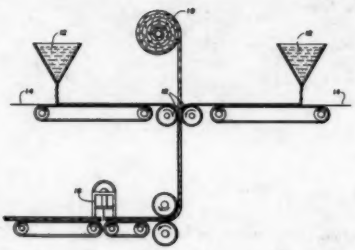
fabric, the specific gravity of the laminate board being from 0.8 to 1.3.

4,798,763

METHOD OF MOLDING A LAMINATED FOAMABLE SHEET

Hamid G. Kia, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 11, 1986, Ser. No. 884,785
Int. Cl.[4] B29C 39/10, 67.22; C08J 9/08
U.S. Cl. 428—285 3 Claims



1. The method of molding a glass fiber reinforced polyurethane foamed article by first laminating a glass fiber mat wetted with a composition of urethane foam precursors containing a solid catalyst between two barrier sheets and then placing the laminate in a heated mold having two platens defining a cavity therein wherein heat activates said catalyst to start a rapid foaming reaction such that the laminate expands to fill the cavity, said method comprising the steps of:

(1) wetting a glass fiber mat with a composition of urethane foam precursors containing a solid catalyst of stearate salt inactive at temperatures below its melting temperature,

(2) placing said wetted glass fibers between two barrier sheets,

(3) compressing under suitable pressure said wetted glass fibers between said barrier sheets into a laminate,

(4) storing said laminate for a predetermined length of time not longer than 1 month,

(5) positioning said laminate into said heated mold, the temperature of said mold being at least that of the melting temperature of said solid catalyst,

(6) compressing said laminate in said heated mold under sufficient pressure and for a sufficient length of time, whereby said solid catalyst melts and causing said urethane precursors to foam in such a way that said laminate expands to fill the cavity of said mold,

(7) curing said foamed article in said mold under heat and pressure,

(8) removing said foamed article from said mold.

3. A glass fiber reinforced polyurethane foamed article molded by the process of claim 1.

4,798,764

ARSENATE DOPANT SOURCES AND METHOD OF MAKING THE SOURCES

Richard E. Tressler, Julian, and Herman J. Boeglin, State College, both of Pa., assignors to STEMCOR Corporation, Cleveland, Ohio

Filed Jun. 8, 1983, Ser. No. 502,262
Int. Cl.[4] B05D *3/02*; B32B *19/00, 19/04*
U.S. Cl. 428—312.6 16 Claims

1. A dopant source for the vapor phase transport of arsenic dopant at elevated temperature comprising at least one compound of the group consisting of $AlAsO_4$, $YAsO_4$, $Mg_6As_2O_{11}$, $Mg_3As_2O_8$, $Ca_6As_2O_{11}$, $Ca_3As_2O_8$, $Ba_3As_2O_8$, $Ba_6As_2O_{11}$, $Sr_6As_2O_{11}$, and $Sr_3As_2O_8$, said compounds disassociating in the temperature range 500° C. to 1400° C. to release arsenic oxide vapors, wherein said compound is in solution.

3. A dopant source for the vapor phase transport of arsenic dopant at elevated temperature comprising at least one compound of the group consisting of $AlAsO_4$, $YAsO_4$, $Mg_6As_2O_{11}$, $Mg_3As_2O_8$, $Ca_6As_2O_{11}$, $Ca_3As_2O_8$, $Ba_3As_2O_8$, $Ba_6As_2O_{11}$, $Sr_6As_2O_{11}$, and $Sr_3As_2O_8$, said compounds disassociating in the temperature range 500° C. to 1400° C. to release arsenic oxide vapors, wherein said compound is deposited on a rigid, porous support structure.

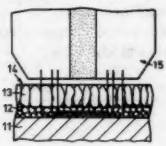
11. The method of preparing the compounds of the group consisting of $AlAsO_4$, $YAsO_4$, $Mg_6As_2O_{11}$, $Mg_3As_2O_8$, $Ca_6As_2O_{11}$, $Ca_3As_2O_8$, $Ba_3As_2O_8$, $Ba_6As_2O_{11}$, $Sr_6As_2O_{11}$, and $Sr_3As_2O_8$, comprising heating arsenic pentoxide in the presence of a compound selected from the group consisting of Al_2O_3, Y_2O_3, MgO, BaO, CaO, SrO and mixtures thereof.

4,798,765

PERPENDICULAR MAGNETIC RECORDING MEDIUM

Yasuo Ishizaka; Noboru Watanabe; Kazuo Kimura, all of Yokohama, and Eiichiro Imaoka, Sagamihara, all of Japan, assignors to Victor Company of Japan Ltd., Japan

Filed Mar. 25, 1986, Ser. No. 843,757
Claims priority, application Japan, Mar. 28, 1985, 60-64630; Jul. 17, 1985, 60-157908; Jul. 17, 1985, 60-157909
The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.
Int. Cl.[4] G11B *5/66*
U.S. Cl. 428—336 6 Claims



1. A perpendicular magnetic recording medium on which a signal is recorded and from which the signal is reproduced by a magnetic head, said perpendicular magnetic recording medium comprising:

a recording medium base;

a lower layer formed on the recording medium base; and an upper layer formed on the lower layer,

said lower layer being made of a first material including cobalt, chromium and at least one of niobium and tantalum, said lower layer having an in-plane coercivity in a range of 10 to 220 Oe and a thickness of 0.15 micron or less said lower layer including a layer which is substantially magnetically-isotropic,

said upper layer being made of a second material including cobalt, chromium and at least one of niobium and tantalum such as is included in said lower layer,

concentrations of niobium and tantalum in said second material being less than concentrations of niobium and tantalum in said first material, respectively.

4,798,766

SURFACE MODIFIED CLAYS AND PROCESS OF MANUFACTURE

Camilla A. Rice, Sandersville, Ga., assignor to E.C.C. America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 943,669, Dec. 17, 1986, Pat. No. 4,789,403, which is a continuation-in-part of Ser. No. 887,320, Jul. 22, 1986, abandoned, and a continuation-in-part of Ser. No. 933,083, Nov. 20, 1986, Pat. No. 4,690,868, which is a continuation-in-part of Ser. No. 699,014, Feb. 8, 1985, abandoned. This application Aug. 26, 1987, Ser. No. 89,510
Int. Cl.[4] B32B *5/16*; C23C *16/00*
U.S. Cl. 428—404 27 Claims

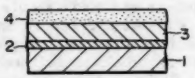
1. A particulate layered lattice silicate having the general formula $E_iM_xSi_yO_n(OH)_m$ where M is Al, Mg, or Fe, x=2 to 6, y=2 to 8, n=2 to 20, m=0 to 8, and E_i is one or more exchangeable ions, the surfaces of which have been modified by surface bound NH_2 groups and further reacted with an organic compound selected from the class consisting of monomers, co-monomers, and prepolymers which are condensible with the amine group.

4,798,767

OPTICAL INFORMATION RECORD MEDIUM

Tokuei Aoki; Junichiro Kudo, and Katsumi Kohno, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 107,342
Claims priority, application Japan, Oct. 14, 1987, 62-242136
Int. Cl.[4] B32B *27/36*; C08G *63/62*
U.S. Cl. 428—412 3 Claims



1. An optical information record medium having an optical information recording layer wherefrom signals are optically read on a substrate made of a polycarbonate resin, wherein the quantity of a residual chlorine ion contained in said substrate is adjusted to be no more than 1.0 ppm.

4,798,768

LUMINESCENT ALUMINO-SILICATE AND/OR ALUMINO-BORATE GLASS COMPRISING LANTHANUM AND/OR GADOLINIUM AND LUMINESCENT SCREEN PROVIDED WITH SUCH A GLASS

Gerrit Oversluizen, and Anne-Marie A. Van Dongen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1987, Ser. No. 105,921
Claims priority, application Netherlands, Oct. 8, 1986, 8602518
Int. Cl.[4] C09K *11/80*
U.S. Cl. 428—426 4 Claims

1. A luminescent alumino-silicate and/or alumino-borate glass comprising lanthanum and/or gadolinium and activated by a rare earth metal, characterized in that the glass is activated by at least one of the rare earth metals Tb^{3+} and Ce^{3+} has a composition comprising 35–85 mol% of SiO_2 and/or B_2O_3, 1–35 mol% of La_2O_3 and/or Gd_2O_3, 5–45 mol% of Al_2O_3 and 0.5–30 mol% of Tb_2O_3 and/or Ce_2O_3 in which the La_2O_3 and/or Gd_2O_3 are replaceable in amounts up to than 50 mol% by one or more of the oxides Y_2O_3, Sc_2O_3, Lu_2O_3, ZrO_2, P_2O_5 and the alkaline earth metal oxides, the rare earth metal oxides being at least 99.99% pure and the other oxides being at least 99.999% pure, the luminescent glass having a

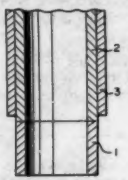
quantum efficiency of at least 46% when excited by 254 nm radiation.

4,798,769

ELECTRODE SUPPORTING CONDUIT TUBE FOR ELECTRICAL HEATING OF UNDERGROUND HYDROCARBON RESOURCES

Osamu Hayashi, Toyonaka; Sadamu Matsuda, Amagasaki; Ichiro Takahashi, Suita; Goro Okamoto, Itami, and Kazuo Okahashi, Toyonaka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 837,661, Mar. 7, 1986, abandoned, which is a continuation of Ser. No. 606,189, May 2, 1984, abandoned. This application Feb. 5, 1987, Ser. No. 14,207
Claims priority, application Japan, Jun. 17, 1983, 58-109649
Int. Cl.[4] B32B *15/08*; F16L *9/14*
U.S. Cl. 428—460 3 Claims



1. An electrode supporting conduit tube for electrical heating above 300° C. of underground hydrocarbon resources, which comprises:

a metal conduit tube; and

an insulating member adhered on and around the outer peripheral surface of said metal conduit tube, said insulating member being a laminated body of a web of glass fiber impregnated with water-dispersion varnish of PEEK, PPS or a combination thereof, that is hot-water resistant and is made up or particles ranging in size from 0.5 μm to 10 μm and a thermoplastic resin which is made up of particles ranging in size from 0.5 μm to 10 μm and a polyether/ether/ketone resin film, which is formed by first alternately winding said glass fiber web on said resin film on and around the outer peripheral surface of said metal conduit tube for a plurality of winding turns, and then subjecting both polyether/ether/ketone resin film and glass fiber web thus wound on and around said metal conduit tube to shaping under heat and pressure at a heating temperature of from 350° C. to 450° C. and under a pressure of from 10 kg/cm^2 to 200 kg/cm^2 and wherein the rate of impregnation of glass fiber by said water dispersion varnish is 30% by weight

wherein a final laminate structure is made of the metal conduit tube, PEEK and an impregnated glass cloth.

4,798,770

HEAT RESISTING AND INSULATING LIGHT ALLOY ARTICLES AND METHOD OF MANUFACTURE

Tadashi Donomoto; Mototsugu Koyama, and Masaaki Nagaoka, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 850,421, Apr. 7, 1986, abandoned, which is a continuation of Ser. No. 706,253, Feb. 28, 1985, abandoned, which is a continuation of Ser. No. 419,478, Sep. 17, 1982, abandoned. This application Nov. 6, 1987, Ser. No. 119,238
Claims priority, application Japan, Sep. 24, 1981, 56-151564
Int. Cl.[4] B22F *3/26*; B23P *17/00*
U.S. Cl. 428—547 14 Claims

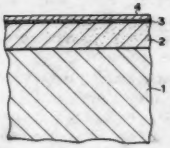
1. A heat-resisting and insulating light alloy article, comprising:

(a) a body of a light alloy selected from the group consisting of aluminum alloys and magnesium alloys,

(b) a composite fiber/light alloy layer formed on the body, wherein the composite layer is made essentially of a light alloy of the same type as the light alloy of which the body is made and heat-resistant fibers having a lower heat conductivity than the light alloy, said fibers being integrally bonded by the light alloy and being selected from the group consisting of Al_2O_3 fibers, ZrO_2 fibers, SiC fibers, Al_2O_3-SiO_2 fiber, glass fibers, carbon fibers, boron fibers, stainless steel fibers, SiC whiskers, Si_3N_4 whiskers, and potassium titanate whiskers,

(c) a first layer of a heat-remaining alloy sprayed onto said composite layer, which alloy is selected from the group consisting of Ni-Cr alloy, Ni-Cr-Al alloy and Ni-Cr-Al-Y alloy, and

(d) a second layer of a ceramic base material sprayed onto said first layer, which material is selected from the group consisting of ZrO_2, Al_2O_3, MgO, Cr_2O_3, and mixtures thereof, and wherein the heat-resisting alloy, of which the first layer is made, has a thermal expansion coefficient



which is higher than the ceramic material of said second layer, but lower than the composite fiber/light alloy layer.

8. A method for producing a heat resisting and insulating light-alloy article comprising the steps of

placing a preform of heat-resistant fibers at a given position in a cavity of a mold,

pouring a molten light alloy into the mold cavity,

subjecting the molten light alloy in the mold cavity to liquid metal forging, thereby causing the light alloy to fill up the space among the fibers of the preform

allowing the light alloy to solidify to form a block of the light alloy having a composite fiber/light alloy layer integrated on its surface,

removing the block from the mold,

spraying a heat-resisting alloy onto the composite fiber/light alloy layer on the block, and

further spraying a ceramic base material onto the sprayed layer of the heat-resisting alloy.

4,798,771

BEARINGS AND OTHER SUPPORT MEMBERS MADE OF INTERCALATED GRAPHITE

Ferdinand L. Vogel, Whitehouse Station, N.J., assignor to Intercal Company, Port Huron, Mich.

Filed Aug. 27, 1985, Ser. No. 770,293
The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.
Int. Cl.[4] B22F *7/04*; C32B *15/16*; C10M *103/02, 125/02*
U.S. Cl. 428—564 17 Claims

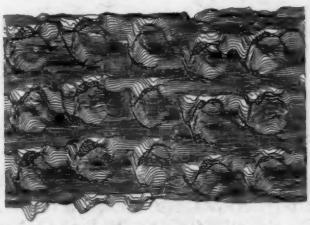
1. A bearing member consisting essentially of a shaped, compacted, load bearing, low friction body formed from an intercalated graphite which is stable in air and at an elevated temperature, and is produced by an intercalation reaction of graphite and an intercalating species, said intercalating species producing the stability in air and at elevated temperature of the intercalated graphite, said reaction causing the presence of oxidized carbon in the graphite and the presence of negatively charged molecules within the intercalating species.

4,798,772

STEEL SHEETS FOR PAINTING AND A METHOD OF PRODUCING THE SAME

Kusuo Furukawa, Tokyo, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed Dec. 31, 1986, Ser. No. 948,122
Claims priority, application Japan, Jan. 17, 1986, 61-7769; Nov. 25, 1986, 61-278876
Int. Cl.[4] B21D *53/00*
U.S. Cl. 428—600 3 Claims



1. A steel sheet for painting, characterized in that a center-line average surface roughness Ra of said steel sheet is within a range of 0.3 to 3.0 μm and a microscopic shape constituting said surface roughness is comprised of trapezoidal mountain portions having a flat top surface, groove-like valley portions formed so as to surround a whole or a part of the mountain portion and middle flat portions formed between the mountain portions outside the valley portion so as to be higher than the bottom of the valley portion and lower than or equal to the top surface of the mountain portion and satisfies the following relations:

$0.85 \leqq Sm/D \leqq 3.0$

$Sm - D < 450$ (pm)

$30 \leqq do \leqq 500$ (μm)

$20 \leqq \eta \leqq 95$ (%),

wherein Sm is a mean center distance between the adjoining mountain portions, D is a mean diameter in the outer periphery of the valley portion, d_0 is a mean diameter in the flat top surface of the mountain portion, and η is a ratio of a sum of areas in the flat top surface of the mountain portion and areas in the flat surface of the middle flat portion to a whole area of the steel sheet.

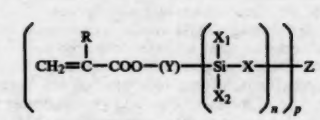
4,798,773

SOLID POLYMER ELECTROLYTE COMPOSITION

Eiki Yasukawa; Kunio Kihara, and Mayumi Tsuboi, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,918
Claims priority, application Japan, Nov. 21, 1986, 61-278340; Nov. 21, 1986, 61-278341; Dec. 4, 1986, 61-289641
Int. Cl.[4] H01M *6/16*
U.S. Cl. 429—192 12 Claims

1. A solid polymer electrolyte composition comprising a matrix polymer comprising at least one kind of a macromer represented by the following formula (I) as a monomer component, and an electrolyte salt compound:

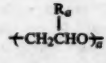


(I)

wherein:

R represents a hydrogen atom or a methyl group;

Y represents a group represented by the formula



wherein R_a represents a hydrogen atom or a methyl group and a represents 0 to 60;

X represents a divalent polyene glycol residue represented by the formula

wherein R_b represents a hydrogen atom or a methyl group and b represents 2 to 60;

X_1 and X_2 each represents a monovalent polyalkylene glycol compound residue represented by the formula

wherein R_c represents a hydrogen atom or a methyl group, R′ represents a hydrogen atom, an alkyl group having 1 to 20 carbon atoms or an aryl group having 6 to 20 carbon atoms and c represents 2 to 60;

Z represents a hydrogen atom, a monovalent alkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, or a polyvalent alkyl group selected from ethylene, methyl ethylene and 1,2,3-propanetriyl residue, and

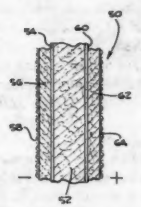
n and p each represents an integer of 1 to 3.

4,798,774

GAS PERMEABLE ELECTRODE FOR ELECTROCHEMICAL SYSTEM

Frank A. Ludwig, Rancho Palos Verdes, and Carl W. Townsend, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 14, 1987, Ser. No. 132,514
Int. Cl.[4] H01M *8/06*
U.S. Cl. 429—12 28 Claims



1. An electrode apparatus adapted for use in an electrochemical system having an anode compartment and a cathode compartment in which gasaand ions are produced and consumed in

said compartments during electrical current generation by said system, wherein said electrode apparatus comprises:

a membrane for separating said anode compartment from said cathode compartment, said membrane having a cathode side and an anode side and comprising ion permeable regions to provide transfer of ions between the cathode and anode sides of the membrane and gas-permeable regions to provide transfer of gases between the cathode and anode sides of the membrane;

cathode means located in the cathode compartment on said cathode side of the membrane and in contact with said membrane for generating electric current; and

anode means located in the anode compartment on said anode side of the membrane and in contact with said membrane for generating electric current wherein gas and ions generated at said cathode means and anode means migrate through said membrane to provide transfer of said gas and ions between said anode and cathode compartments.

4,798,775
PROCESS FOR PRODUCING SILVER HALIDE PHOTOGRAPHIC EMULSION

Toshihiko Yagi, Kanagawa, and Shinya Shimura, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 744,472, Jun. 13, 1985, abandoned.
This application Feb. 2, 1987, Ser. No. 11,363
Claims priority, application Japan, Jun. 20, 1984, 59-127189
Int. Cl.[4] G03C 1/02
U.S. Cl. 430—569 5 Claims

1. A process for producing a silver halide photographic emulsion by supplying a solution of water soluble silver salt and a solution of water soluble halide in the presence of a protective colloid, said process comprising, in sequence, the steps of:

(a) forming silver halide nuclear grains with a silver iodide content of 0 to 5 percent in a mother liquor, the pBr of the mother liquor being maintained at between 2.0 and −0.7 for at least the initial half of the time necessary to form said nuclear grains,

(b) forming monodispersed, substantially spherical, silver halide seed grains by ripening the nuclear grains formed in (a), in a mother liquor containing a silver halide in an amount of 10^{-4} to 5 moles per liter of mother liquor and,

(c) increasing the size of the seed grains by at least one method taken from the group consisting of (1) the addition of a solution of a water soluble silver salt and a solution of a water soluble halide and (2) the addition of fine silver halide grains.

4,798,776
LIGHT RECEIVING MEMBERS WITH SPHERICALLY DIMPLED SUPPORT

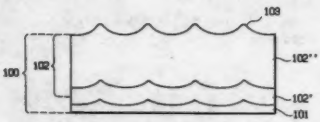
Mitsuru Honda; Atsushi Koike, both of Chiba; Kyosuke Ogawa, Miye, and Keiichi Murai, Chiba, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1986, Ser. No. 909,892
Claims priority, application Japan, Sep. 21, 1985, 60-209678; Sep. 25, 1985, 60-210257; Oct. 2, 1985, 60-219912; Oct. 8, 1985, 60-224460; Oct. 15, 1985, 60-227648; Oct. 16, 1985, 60-228737
The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.
Int. Cl.[4] G03G 5/082, 5/10, 5/14
U.S. Cl. 430—39 45 Claims

1. A light receiving member comprising:

(a) a support having an uneven-shaped surface of a plurality of spherical dimples; each of said spherical dimples having an identical radius of curvature R and an identical width D, wherein the ratio D/R of said width D to said radius of curvature R being from 0.03 to 0.07; and

(b) a light receiving layer having a free surface on the support; said light receiving layer being a multi-layered structure composed of an amorphous material containing silicon atoms as the main constituent, at least one kind selected from the group consisting of oxygen atoms, carbon atoms and nitrogen atoms, and at least one kind selected from the group consisting of hydrogen atoms and halogen atoms; and containing at least a layer region functioning as a photosensitive layer.



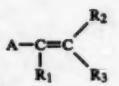
2. The light receiving member of claim 1, wherein said spherical dimples are formed by the impact of a plurality of rigid true spheres, each sphere substantially of an identical diameter, falling from substantially the same height.

4,798,777
ELECTROPHOTOGRAPHIC MEMBER CONTAINING VINYLENE BENZOCARAZOLE AS CHARGE TRANSPORTING MATERIAL

Takao Takiguchi, Tokyo; Masakazu Matsumoto, and Toshihiro Kikuchi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1987, Ser. No. 14,855
Claims priority, application Japan, Feb. 19, 1986, 61-034775
Int. Cl.[4] G03G 5/10
U.S. Cl. 430—59 12 Claims

1. An electrophotographic photosensitive member comprising a charge generating material and a charge transport material containing a compound represented by the formula (1) shown below:



(1)

wherein A represents 1,2-, 2,3- or 3,4-benzocarbazolyl group; R_1, R_2 and R_3, which may be the same or different, each represent hydrogen atom, alkyl group, aralkyl group, aryl group or heterocyclic group, with proviso that R_2 and R_3 cannot be hydrogen atoms at the same time.

4,798,778
LIQUID ELECTROSTATIC DEVELOPERS CONTAINING MODIFIED RESIN PARTICLES

El-Sayed Lyla M., West Chester, Pa.; Steven P. Schmidt, Greenville; Torence J. Trout, Wilmington, both of Del., and Robert D. Mitchell, Pittsford, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 3, 1987, Ser. No. 80,669
Int. Cl.[4] G03G 9/12
U.S. Cl. 430—115 60 Claims

1. A positive-workinq liquid electrostatic developer consisting essentially of

(A) nonpolar liquid having a Kauri-butanol value of less than 30, present in major amount,

(B) thermoplastic resin selected from the group consisting of an ethylene homopolymer having a carboxylic acid substituent and copolymer of ethylene and at least one other monomer having a carboxylic acid substituent, the acid substituent being modified into a substituent selected from the group consisting of an ester. ester having substituents selected from the group consisting of hydroxyl, carboxyl, amine and alkyl of at least one carbon atom; amide, amide having substituent selected from the group consisting of hydroxyl, carboxyl, amine and alkyl of at least one carbon atom; and acid halide,

the resin being in particulate form having an average particle size by

(C) nonpolar liquid soluble ionic or zwitterionic compound.

4,798,779

PROCESS FOR FORMING AN IMAGE BY SILVER SALT DIFFUSION TRANSFER

Yoshio Idota; Yukio Karino; Hiroshi Hayashi, and Hideki Tomiyama, All of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

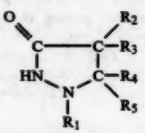
Filed Jan. 29, 1987, Ser. No. 8,452

Claims priority, application Japan, Jan. 30, 1986, 61-18400

Int. Cl.[4] G03C 5/54

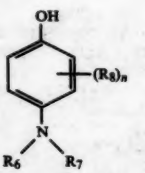
U.S. Cl. 430—202 11 Claims

1. A process for forming an image by silver salt diffusion transfer comprising developing a light-sensitive element, which element comprises a support having provided thereon a light-sensitive silver halide emulsion layer which has been imagewise exposed to light, by an alkaline processing composition in the presence of a silver halide solvent, so that at least a part of silver halide unexposed in said emulsion layer is converted to a transferable silver complex salt, and then transferring at least a part of said silver complex salt to an image-receiving layer containing a silver precipitating agent to form an image on said imagereceiving layer, wherein the concentration of said silver precipitating agent in said image-receiving layer is in the range of from 2×10^{-6} to 8×10^{-6} mol/m^2 and at least one of said light-sensitive element and said alkaline processing composition contains at least one of a compound represented by formula (I) or a compound represented by formula (II)



(I)

wherein R_1 represents a phenyl group or a phenyl group substituted by an alkyl group having 1 or 2 carbon atoms; R_2 and R_3 each represents a hydrogen atom, an alkyl group having from 1 to 3 carbon atoms, or a hydroxyalkyl group having from 1 to 3 carbon atoms; and R4 and R5 each represents a hydrogen atom, an alkyl group having from 1 to 3 carbon atoms, a phenyl group, a phenyl group substituted by an alkyl group having from 1 to 3 carbon atoms;



(II)

wherein R_6 and R_7 each represents a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms; R_8 represents an alkyl group having from 1 to 4 carbon atoms; and n represents an integer of from 1 to 3.

4,798,780

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE SYSTEMS COMPRISING A HYDRAZINE WHICH CONTAINS A GROUP UNDERGOING A CYCLIZATION REACTIONUPON CLEAVAGE FROM THE HYDRAZINE

Kevin P. Hall, Harlow, and Andrew W. Mott, Bishops Stortford, both of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1987, Ser. No. 68,146

Claims priority, application United Kingdom, Jul. 16, 1988, 8617335

Int. Cl.[4] G03C 1/06

U.S. Cl. 430—264 21 Claims

1. A silver halide photographic light sensitive emulsion containing a hydrazine of the general formula

$$R^3\text{-}NR^4\text{-}NR^5\text{-}G\text{-}X \quad (I)$$

in which:

R^3 represents an aryl group,

one of R^4 and R^5 is a hydrogen and the other is selected from hydrogen, aryl sulfonyl and trifluoroacetyl,

G represents carbonyl, sulfonyl, sulfoxy, phosphoryl or an N-substituted or unsubstituted imino group and

X is a moiety such that at a pH in the range of 9.5 to 12.5 in the presence of an oxidised hydroquinone a cylisation reaction takes place cleaving the moiety -G-X from the remainder of the molecule and forming a cyclic structure comprising atoms of the moiety -G-X in a ring of said cyclic structure.

12. A photographic element comprising a support bearing one or more layers of an emulsion as claimed in claim 1.

13. A method of recording an image which comprises image wise exposing an element as claimed in claim 12 and developing the exposed element in a developer having a pH in the range 9.5 to 12.5.

4,798,781

FABRICATION PROCESS OF OPTICAL RECORDING MEDIUM

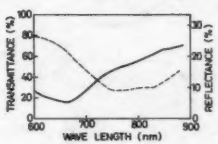
Sumio Hirose, Yokohama; Hiroshi Ozawa, Isehara; Kenji Abe, and Yoichi Hosono, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo and Yamamoto Chemicals, Inc., Yao, both of, Japan

Filed Jul. 31, 1986, Ser. No. 891,178

Claims priority, application Japan, Aug. 6, 1985, 60-171787

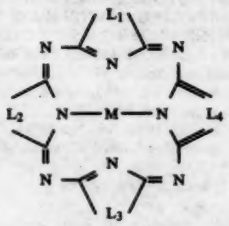
Int. Cl.[4] G11B 7/24; G01D 9/00; G03C 1/72, 5/16

U.S. Cl. 430—270 16 Claims



1. A process for the fabrication of an optical recording medium permitting writing and reading-out of signals without any reflective layer made of an inorganic compound, which comprises:

(a) providing a phthalo/naphthalocyanine dye represented by the following formula (I):



(I)

wherein M is a metal, metal oxide or metal halide, and L_1, L_2, L_3 and L_4 are each a benzene or naphthalene ring skeleton which is unsubstituted or substituted by at least one monovalent substituent —Z selected from the group consisting of the following substituents: $—R^1$, $—OR^2$, $—SiR^3R^4R^5$, $—SR^6$, $—COR^7$, $—COOR^8$, $—CONHR^9$, $—NR^{10}R^{11}$, $—R^{12}OR^{13}$, and $—R^{14}X$ wherein R^1–R^{14} are each a hydrocarbon group having from 1 to 12 carbon atoms and X is a halogen atom, wherein at least one ring skeleton is substituted, and wherein the total number of carbon atoms in each and all of the substituent or substituents —Z contained per molecule is 20–48;

(b) dissolving the phthalo/naphthalocyanine dye in an organic solvent having a solubility parameter smaller than 8.5, thereby preparing a dye solution; and

(c) coating the dye solution on a transparent thermoplastic resin substrate surface having pregrooves, pits or holes which are formed from a thermoplastic resin for preformatting signals, thereby forming a vapor untreated optical recording layer comprising the phthalo/naphthalocyanine dye on the pregroove-, pit- or hole-defining surface of the resin substrate, and wherein the pregrooves, pits or holes in the substrate are formed with a thermoplastic resin.

4,798,782

POLY(ACETYLENE) FILMS HAVING LOCALIZED ZONES OF A LOW CONDUCTIVITY MATERIAL

Philip C. Allen, Feltham, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Jan. 15, 1987, Ser. No. 3,481

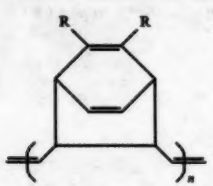
Claims priority, application United Kingdom, Feb. 8, 1986, 8603162; Feb. 13, 1986, 8603557

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—270 **5 Claims**

1. A coherent poly(acetylene) film having localized zones of a material other than poly(acetylene)

said coherent poly(acetylene) film is derivable from a poly(acetylene) precursor of formula (I):



(I)

where R is a substituent which is hydrogen or a group selected from an alkyl, a halo alkyl, an ester and combinations thereof, by selectively irradiating discrete areas of a film of poly(acetylene) precursor formula (I) and then heating so that upon heating the selectively irradiated areas form the localized zones and the nonirradiated areas transform into poly(acetylene),

and said material other than poly(acetylene) has modified optical and electrical properties which are different from that of conventional pristine poly(acetylene) film, said localized zones being integral with the poly(acetylene) film.

4,798,783

METHOD OF PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND PHOTOGRAPHIC COLOR DEVELOPING COMPOSITION

Takatoshi Ishikawa; Hiroshi Fujimoto; Nobutaka Ohki, and Morio Yagihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 6, 1987, Ser. No. 117,727

Int. Cl.[4] G03C *5/24*

U.S. Cl. 430—372 **20 Claims**

1. A method of processing a silver halide color photographic material, which comprises processing an imagewise exposed photographic material with a color developer containing an aromatic primary amine color developing agent and a compound represented by the formula:

(I)

wherein

X represents a trivalent group necessary to an imagewise exposed complete a condensed ring;

R^1 and R^2 each represents an alkylene group, an arylene group, an alkenylene group, or an aralkylene group.

4,798,784

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL INCLUDING A HYDROLYZABLE TYPE DIR COUPLER INCLUDING BLEACHING AND BLEACH-FIXING PROCESSING

Shinzo Kishimoto; Toshihiro Nishikawa; Akira Abe, and Junya Nakajima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 26, 1986, Ser. No. 935,494

Claims priority, application Japan, Nov. 26, 1985, 60-265915

Int. Cl.[4] G03C *7/00, 5/38, 5/44, 7/32*

U.S. Cl. 430—382 **20 Claims**

1. A method for processing a silver halide color photographic material, which comprises color developing an exposed silver halide color photographic material containing an alkali hydrolyzable type DIR coupler, rapidly processing the developed silver halide color photographic material with a liquid having a bleaching ability, and subsequently with a liquid having a bleach-fixing ability, to thereby form a color image.

4,798,785

RECORDING ELEMENTS COMPRISING WRITE-ONCE THIN FILM ALLOY LAYERS

Kee-Chuan Pan; Yuan-Sheng Tyan, both of Webster, and Fridrich Vazan, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

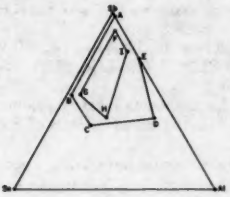
Filed Jun. 5, 1987, Ser. No. 58,721

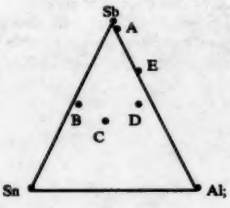
Int. Cl.[4] G03C *1/72*

U.S. Cl. 430—495 **6 Claims**

1. A recording element comprising a write-once amorphous thin-film optical recording layer of an alloy having a composition within a polygon in a ternary composition diagram of antimony, aluminum, and tin; wherein

(a) the composition diagram is





and

(b) the polygon has the following vertices and corresponding coordinates in atom percent:

Vertices	Coordinates		
	Sb	Sn	Al
A	98	0	2
B	54	44	2
C	36	44	20
D	40	10	50
E	74	0	26

4,798,786

LIVING CELLS ENCAPSULATED IN CROSSLINKED PROTEIN

Thomas R. Tice, Birmingham, and William E. Meyers, Helena, both of Ala., assignors to Stolle Research and Development Corporation, Cincinnati, Ohio

Filed May 6, 1982, Ser. No. 375,710

Int. Cl.[4] C12N *11/02, 11/10, 11/04, 5/02*

U.S. Cl. 435—177 **26 Claims**

1. A process for the encapsulation of living cells which comprises:

(a) dispersing living cells in an aqueous solution of a capsule wall-forming protein;

(b) forming aqueous droplets of said cell-containing dispersion in an aqueous-immiscible, cell compatible continuous processing medium;

(c) crosslinking said protein with a crosslinking agent which is soluble in said continuous processing medium but substantially insoluble in said aqueous droplets thus forming crosslinked capsules, and adding to the formed crosslinked capsules a capsule wall degradation enzyme for a time sufficient to enlarge pore sizes in said walls to a predetermined average size.

4,798,787

PEPTIDE ANTIBODIES AND THEIR USE IN DETECTING ONCOGENE PRODUCTS

Francis P. McCormick, Berkeley; Gail L. Wong, Oakland; Robin Clark, San Leandro; Norman Arnheim, Piedmont, and Danute E. Nitecki, Berkeley, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 652,752, Sep. 19, 1984, abandoned. This application Oct. 17, 1984, Ser. No. 661,909

Int. Cl.[4] G01N *33/531*; C07K *7/00*; B65D *69/00*

U.S. Cl. 435—7 **23 Claims**

1. A polyclonal antibody preparation that binds selectively to a characteristic marker epitope encompassing amino acid position 12 of an activated form of p21 protein, wherein said polyclonal antibody preparation is specific for a particular amino acid at position 12 and does not bind the p21 protein encoded by the corresponding proto-oncogene.

23. A method for detecting an activated form of p21 protein encoded by an oncogene in a cellular sample of a patient which protein has a characteristic marker epitope encompassing amino acid position 12 which is not present in the p21 protein encoded by the corresponding proto-oncogene and which is not exposed in the undenatured protein, which method comprises:

(a) treating the sample with a protein denaturing agent that causes the epitope to be exposed and does not substantially inhibit binding of an antibody to the epitope of said protein,

(b) incubating the sample with the antibody of claim 1 under conditions that permit the binding of said antibody preparation to said epitope,

(c) incubating the sample with a labeled antibody which binds specifically to the antibody employed in step (b),

(d) washing the incubated sample to remove unbound labeled antibody, and

(e) detecting the presence of labeled immune complexes of the epitope with the antibodies employed in steps (b) and (c).

4,798,788

PROCESSES AND MATERIALS FOR CARRYING OUT MICROCHEMICAL AND MICROBIOLOGICAL TESTS

Thomas J. Sands, 40 Naseby Close, Wellingborough, Northants, NN8 3XB, England

PCT No. PCT/GB85/00278, § 371 Date Feb. 20, 1986, § 102(e) Date Feb. 20, 1986, PCT Pub. No. WO86/00341, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 24, 1985, Ser. No. 833,389

Claims priority, application United Kingdom, Jun. 22, 1984, 8416044

Int. Cl.[4] C12Q *1/12, 1/02, 1/04*

U.S. Cl. 435—37 **13 Claims**

1. A microbiological culture test process for detecting the presence of nitrate-reducing microorganisms in an inoculum sample, which comprises

(a) culturing a microorganism to be tested in the presence of substantially nitrate-free nitrate and of a diazotizable amino-containing fluorophor selected from the group consisting of coumarins and flavones, for a period sufficient to allow reduction of nitrate by said microorganism having the capacity to reduce nitrate to nitrite,;

(b) exposing the culture medium after culture to diazotizing acid conditions thereby to cause diazotization of the fluorophor to the extent of any nitrite present in the medium to form a diazonium derivative which is substantially less fluorescent at a predetermined wavelength at which said fluorophor is fluorescent than said amino-containing fluorophor when assessed for fluorescence under said acid conditions, and

(c) assessing the fluorescence of the culture medium as treated by step (b) at said predetermined wavelength under the acid conditions established in step (b), thereby

to detect presence of a nitrate-reducing microorganism by showing a reduction in fluorescence.

4,798,789

CDNA CLONES CODING FOR POLYPEPTIDES EXHIBITING MURINE INTERLEUKIN-2 ACTIVITY

Frank D. Lee; Takashi Yokota, and Ken-ichi Arai, all of Palo Alto, Calif., assignors to DNAX Research Institute of Molecular and Cellular Biology, Inc., Palo Alto, Calif.

Division of Ser. No. 658,183, Oct. 5, 1984. This application Dec. 17, 1986, Ser. No. 942,600

Int. Cl.[4] C12P *21/00*; C12N *15/00, 1/20*; C07H *21/04*

U.S. Cl. 435—68 16 Claims

1. A process for producing a polypeptide exhibiting murine interleukin-2 activity, said process comprising the steps of:

providing a vector comprising a nucleotide sequence coding for said polypeptide, wherein the nucleotide sequence is capable of being expressed by a host containing the vector and wherein the nucleotide sequence is selected from the group of nucleotide sequences capable of encoding a polypeptide having an amino acid sequence defined by the formula:

Ala—Pro—Thr—Ser—Ser—Ser—Thr—Ser—
Ser—Ser—Thr—Ala—Glu—Ala—Gln—Gln—
Gln—Gln—Gln—Gln—Gln—Gln—Gln—Gln—
Gln—Gln—His—Leu—Glu—Gln—Leu—Leu—
Met—Asp—Leu—Gln—Glu—Leu—Leu—Ser—
Arg—Met—Glu—Asn—Tyr—Arg—Asn—Leu—
Lys—Leu—Pro—Arg—Met—Leu—Thr—Phe—
Lys—Phe—Tyr—Leu—Pro—Lys—Gln—Ala—
Thr—Glu—Leu—Lys—Asp—Leu—Gln—Cys—
Leu—Glu—Asp—Glu—Leu—Gly—Pro—Leu—
Arg—His—Val—Leu—Asp—Leu—Thr—Gln—
Ser—Lys—Ser—Phe—Gln—Leu—Glu—Asp—
Ala—Glu—Asn—Phe—Ile—Ser—Asn—Ile—
Arg—Val—Thr—Val—Val—Lys—Leu—Lys—
Gly—Ser—Asp—Asn—Thr—Phe—Glu—Cys—
Gln—Phe—Asp—Asp—Glu—Ser—Ala—Thr—
Val—Val—Asp—Phe—Leu—Arg—Arg—Trp—
Ile—Ala—Phe—Cys—Gln—Ser—Ile—Ile—
Ser—Thr—Ser—Pro—Gln.

incorporating the vector into the host; and

maintaining the host containing the vector under conditions suitable for expression of the nucleotide sequence into said polypeptide.

4,798,790

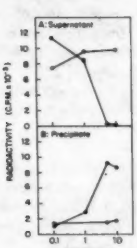
MONOCLONAL ANTIBODY SPECIFIC FOR A PIGMENTATION ASSOCIATED ANTIGEN

Timothy M. Thomson, New York; M. Jules Mattes, Flushing; Lloyd J. Old, New York, and Kenneth O. Lloyd, Bronx, all of N.Y.; Linda Roux, San Diego, Calif., assignors to Sloan-Kettering Institute, New York, N.Y.

Filed Jul. 18, 1985, Ser. No. 756,362

Int. Cl.[4] G01N *33/53, 33/577*; C12N *5/00*; A61K *39/00*

U.S. Cl. 435—7 9 Claims



1. A hybridoma cell line designated TA99 and deposited with the ATCC under Accession Number HB 8704.

4,798,791

VECTOR FOR HIGH LEVEL GENE EXPRESSION

David M. Anderson, Rockville, and Jeffrey C. McGuire, Frederick, both of Md., assignors to Genex Corporation, Gaithersburg, Md.

Filed Nov. 16, 1984, Ser. No. 671,967

Int. Cl.[4] C12P *21/00, 19/34*; C12N *5/00, 7/00*

U.S. Cl. 435—68 23 Claims

1. A method for expressing a gene encoding a desired protein in an *E. coli* host at elevated levels of expression, which comprises:

(a) inserting a structural gene encoding a desired protein and the trpt sequence of the *E. coli* tryptophan operon into a vector replicable in an *E. coli* host, such that said sequence is adjacent to and downstream from the translation termination codon of said structural gene;

(b) transforming said *E. coli* host with said vector; and

(c) expressing said structural gene in the thus transformed *E. coli* host.

4,798,792

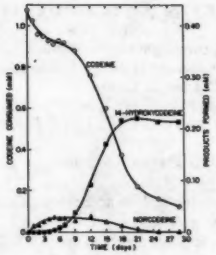
BACTERIAL HYDROXYLATION OF CODEINE

Patricia A. Harder, and Daniel A. Kunz, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 9, 1985, Ser. No. 774,026

Int. Cl.[4] C12P *17/18*

U.S. Cl. 435—119 15 Claims



1. A process for preparing 14-hydroxycodeine which comprises: contacting codeine or a water-soluble salt thereof with bacteria of the genus Streptomyces for a period of at least about three days while said bacteria are being aerobically cultured in a rich medium in which the growth nutrients are supplied in excess; and recovering 14-hydroxycodeine from the medium.

4,798,793

IMMOBILIZED MUCOR MIEHEI LIPASE FOR TRANSESTERIFICATION

Peter Eigtved, Holte, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 707,792, Mar. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,752, Sep. 5, 1984, abandoned. This application Jul. 31, 1987, Ser. No. 80,214
Claims priority, application Denmark, Sep. 5, 1983, 4025/83
Int. Cl.[4] C12P 7/64; C12N 11/08, 9/20; C12R 1/785
U.S. Cl. 435—134 9 Claims

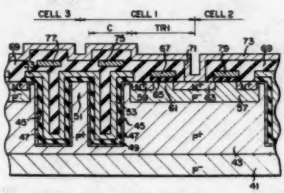
1. A method for production of an immobilized lipase preparation adapted for interesterification of fats, which comprises contacting an aqueous solution of *Mucor miehei* lipase with a particulate, macroporous, phenol-formaldehyde adsorbent resin having a particle size such that more than 90% of the resin particles have a size between 100 and 1000 μm, at a pH in range of 5–7 to bind said lipase to said resin to form said immobilized lipase whereby at least 75% of the lipase activity is removed from the aqueous lipase solution to form a spent aqueous solution, then separating the immobilized lipase from the spent aqueous solution and thereafter drying the separated immobilized lipase to a water content of between about 2 and 40%, the resulting preparation having an activity of at least 10 batch interesterification units (BIU) per gram dry basis, and at least 5000 lipase units (LU) per gram dry basis.

4,798,794

METHOD FOR MANUFACTURING DYNAMIC MEMORY CELL

Mitsugi Ogura, and Fujio Masuoka, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 741,150, Jun. 4, 1985, Pat. No. 4,688,064. This application Jun. 2, 1987, Ser. No. 56,726
Claims priority, application Japan, Jun. 5, 1984, 59-114912; Jun. 5, 1984, 59-114913
Int. Cl.[4] H01L 29/96
U.S. Cl. 437—41 10 Claims



1. A method of manufacturing a dynamic memory cell, comprising the steps of:

forming a first semiconductor layer of a first conductivity type on a semiconductor substrate of the first conductivity type, the first semiconductor layer having an impurity concentration higher than that of said semiconductor substrate;

forming on a major surface portion of the first semiconductor layer a mask for forning at least one capacitor formation hole;

forming by use of the mask the hole in the major surface portion of the first semiconductor layer;

forming a second semiconductor layer of a second conductivity on the inner surface of the hole using as a mask the mask used for hole formation;

forming a capacitor formation insulating film on said second semiconductor layer and forming a cell insulating film on a separation area of said first semiconductor layer that insulates electrically the dynamic memory cell, the thickness of said cell insulating film being equal to or smaller than the thickness of said capacitor formation insulating film;

forming a capacitor electrode on the capacitor formation insulating film; and

forming a MOS transistor in the first semiconductor layer.

4,798,795

BIOTINYLATING AGENTS

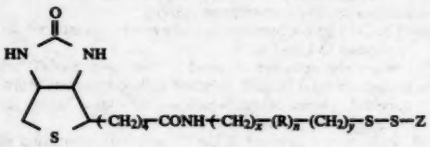
Gerald F. Sigler, San Diego, Calif., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 15,324, Feb. 17, 1987, Pat. No. 4,709,037. This application Sep. 3, 1987, Ser. No. 92,783
Int. Cl.[4] C07K 15/00, 17/02, 17/06
U.S. Cl. 435—177 9 Claims

1. A method of recovering a complex of target antigen and target binding biotin labeled protein from a mixture containing said target antigen, said method comprising:

providing a thiol containing binding protein for said target antigen;

preparing a biotin derivative of said thiol containing binding protein by contacting said binding protein in an aqueous buffer maintaining a pH within the range of 6 to 9 with a compound of the formula:



where x and y integers of 1 ot 5, n is 0 or 1, R is —CONH— or —CH(CO_2H)NHCO— and Z is a pyridyl group optionally substituted with one or more substituents of such type and in such position as to preserve the tautomerism of the thol-thione generated upon cleavage of the —S—S— group in an aqueous dipolar aprotic solvent;

contacting a mixture containing said target antigen with biotin derivatized binding protein to obtain a complex of target antigen and biotin derivatized binding protein;

contacting said complex with immobilized avidin to obtain avidin bound complex; and

treating said avidin bound complex with a thiol whereby said complex is released from said immobilized avidin.

4,798,796

CELL LINES AND THEIR USE FOR THE PRODUCTION PLASMINOGEN ACTIVATORS

Elaine L. Wilson, Newlands, South Africa, assignor to BIO-Response, Inc., Hayward, Calif.

Continuation of Ser. No. 754,798, Jul. 12, 1985, abandoned, which is a continuation of Ser. No. 566,467, Dec. 28, 1983, abandoned. This application Apr. 17, 1986, Ser. No. 854,729
Claims priority, application South Africa, Dec. 30, 1982, 82/9576; Jun. 22, 1983, 83/4576
Int. Cl.[4] C12N 9/64, 9/48, 5/00
U.S. Cl. 435—212 10 Claims

1. A process for producing tissue plasminogen activator, pro-tissue plasminogen activator, or mixtures thereof, comprising culturing, in a culture medium deprived of serum and exogenous macromolecular growth factors, cells of a human cell line, derived from the tissue plasminogen activator-producing human melanoma cell line Bowes, which cells are capable of reproducibly and indefinitely propagating in culture in a medium deprived of serum and exogenous macromolecular growth factors and which product tissue plasminogen activator and/or pro-tissue plasminogen activator, harvesting fluid from said culture, said isolating the activator or mixture from said harvested fluid.

4,798,797
RETROVIRUS ASSOCIATED WITH LYMPHADENOPATHIES AND ADAPTED TO CONTINUOUS LINES OF LYMPHOBLASTOID B CELLS, CAPABLE OF PRODUCING RETROVIRUS CONTINUOUSLY AND PROCESS FOR THEIR PRODUCTION

Luc Montagnier, Le Plessis Robinson; Solange Chamaret, Paris, and Jacqueline Gruest, L'Hay Les Roses, all of France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 731,847, May 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 558,109, Dec. 5, 1983, abandoned, and a continuation-in-part of Ser. No. 706,562, Feb. 28, 1985, abandoned, and a continuation-in-part of Ser. No. 712,959, Mar. 18, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 922,764

Claims priority, application France, May 9, 1984, 84 07151

Int. Cl.[4] C12N *7/00, 5/00;* **A61K** *39/00;* **C12Q** *1/70*

U.S. Cl. 435—235 **31 Claims**

1. A continuous cell line from a culture of human B lymphoblastoid cells, wherein the cells have the following characteristics:

(a) Lymphadenopathy Associated Virus (LAV) is not cytotoxic to the cells;

(b) When the cells are cultured, supernatant from the cells exhibits reverse transcriptase activity;

(c) The cells do not immunologically react with monoclonal antibodies to Leu-3 cells;

(d) When the cells are cultured in the absence of T cell growth factor (TCGF), infected cells continuously produce B-LAV retrovirus, which is a retrovirus having the essential antigenic characteristics of LAV.

19. A retrovirus termed B-LAV, which is comprised of antigen and the antigen is immunologically recognized by sera of a patient afflicted with Lymphadenopathy Syndrome (LAS) or Acquired Immune Deficiency Syndrome (AIDS), and wherein the retrovirus:

(a) exhibits reverse transcriptase activity with a strong affinity for poly(adenylate-oligodeoxy-thymidylate)[poly(A)-oligo$(dT)_{12-18}$] with Mg^{2+};

(b) exhibits tropism for T-lymphocytes;

(c) exhibits preferential tropism for Leu-3 cells;

(d) is cytopathic to Leu-3 cells infected with the retrovirus;

(e) induces the production of p25 viral protein of Lymphadenopathy Associated Virus (LAV) in T-lymphocytes infected with LAV;

(f) exhibits slight antigenic homology with the virus of infectious anemia of the horse (VAIC), in that antibody against VAIC immunoprecipitates p25 viral protein of LAV; and

(g) is capable of infecting continuous B lymphoblastoid cell lines having C.N.C.M. Deposit Accession Nos. I-300, I-301, I-302, and I-303, and of being replicated by said cell lines when cultured;

wherein the retrovirus is in biologically pure form.

4,798,798
APPARATUS FOR MONITORING A CHEMICAL PROCESS

David W. Mehnert, Lake Villa, and Robert C. Dinwoodie, Glenview, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Aug. 17, 1983, Ser. No. 524,131

Int. Cl.[4] C12M *1/36, 1/34, 1/26, 1/12*

U.S. Cl. 435—239 **3 Claims**

1. Fermentation apparatus for conducting a microbiological fermentation in which microorganisms in an aqueous medium convert a substrate to a product and for monictoring said fermentation, comprising

reactor means for carrying out a microbiologial fermentation in which microorganisms in an aqueous medium convert a substrate to a product,

a vial comprising a circular bottom wall and an upstanding cyclindrical sidewall defining an interior region, said sidewall having an inlet port and an outlet port defining a flow path through said interior region of said vial, said inlet and outlet ports comprising spaced-apart tubular segments extending from said sidewall, said vial also having a sampling opening, said vial having an upper cylindrical neck positioned distally from said circular bottom wall and having external threads and an upper lip around said sampling opening,

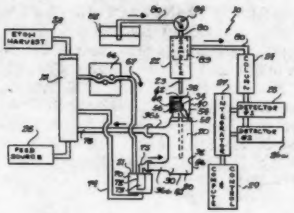
a self-sealing resilient polymeric septum closing said opening of said vial,

a cap having a cylindrical sidewall having interior threads for engaging the external threads of said vial for holding said septum in sealing relationship over said opening, and an orifice in said cap aligned with said opening,

conduct means for communicating said reactor means with said inlet port of said vial,

filter means in communication with said conduit means upstream of said vial for separating fermentation material into a first portion of clarified aqueous medium and a second portion containing cell mass, said filter means directing said first portion of clarified aqueous medium to said vial and diverting said second portion containing cell mass from said vial to said reactor means,

pump means for continuously conducting fermentation material from said reactor means and through said conduit



means to said filter means and for conducting said first portion of clarified aqueous medium through said flow path through said interior region of said vial such that said first portion of clarified aqueous medium conducted through said interior region substantially contemporaneously corresponds to the liquid portion of the fermentation material within said reactor means, and further including first return conduit means communicating said outlet port of said vial with said reactor means for returning said first portion to said reactor and wherein said pump means and said filter means include a second return conduit means for communicating said filter means with said reactor means for returning said second portion to said reactor means,

sampling means comprising a hollow sampling needle for periodically withdrawing an aliquot of said first portion from said interior region of said vial through said septum and means for aspirating the aliquot from said vial through said needle, and

HPLC analysis means for analyzing the contents of said withdrawn aliquot for multiple constituents of the clarified aqueous medium by high performance liquid chromatography.

4,798,799

PROCESS FOR PRODUCING DIOL AND FURAN AND MICROORGANISM CAPABLE OF SAME

Mohamad I. Farbood, West Windsor, and Brian J. Willis, Ramsey, both of N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Continuation of Ser. No. 513,270, Jul. 13, 1983, abandoned. This application Aug. 29, 1986, Ser. No. 903,858

Int. Cl.[4] C12N *1/14*; C12P *7/18, 17/04*; C12R *1/645*

U.S. Cl. 435—254 **12 Claims**

1. A biologically pure culture of the microorganism *Hyphozyma roseoniger*, deposit number ATCC 20624.

4,798,800

PROCESS FOR ISOLATING HUMAN GLOBULAR DOMAIN NC1 OF BASAL MEMBRANE COLLAGEN FROM HUMAN TISSUE

Rupert Timpl, Gauting, and Dietrich Brocks, Hünfelden, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft Zur Foederung Der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,538

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1984, 3410049

Int. Cl.[4] C07K *3/02, 3/22, 15/20*

U.S. Cl. 435—273 **7 Claims**

1. A process for isolating and purifying globular domain NC1 from basal membrane collagen comprising extracting globular domain NC1 containing tissue with guanidine hydrochloride to obtain a globular NC1 containing extract treating said extract with bacterial collagenase to degrade collagen fragments in said extract

separating the degradation products obtained from non-collagenous proteins by chromatography on a weakly basic anion exchanger,

treating the collagen degradation products a second time with collagenase at an elevated temperature and

purifying the globular domain NC1 by molecular sieve fractionation.

4,798,801

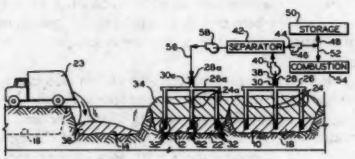
PRODUCTION OF METHANE BY ANAEROBIC FERMENTATION OF WASTE MATERIALS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 11, 1983, Ser. No. 540,952

Int. Cl.[4] C12M *1/04, 1/00*

U.S. Cl. 435—313 **10 Claims**



1. Apparatus for producing methane by anaerobic fermentation of waste material, comprising:

cavity means in the earth for holding a quantity of said waste material;

means for covering a quantity of said waste material in said cavity means and thereby separating said quantity of said waste material from the atmosphere;

first conduit means communicating between said waste material in said cavity means and a location remote from said cavity means for conveying gas comprising carbon dioxide and methane from said cavity means to said location;

gas separation means communicating with said first conduit means at said location for separating carbon dioxide from methane, said first conduit means including at least one pipe having a plurality of apertures therein and disposed in said cavity means extending into and in fluid flow communication with said waste material for receiving gas liberated by the anaerobic fermentation of said waste material and comprising carbon dioxide and methane,through said apertures therein for conveyance via said first conduit means to said gas separation means;

second conduit means communicating between said gas separation means and said waste material in said cavity means for conveying carbon dioxide from said gas separation means to said waste material; and

third conduit means communicating with said gas separation means for conveying methane from said gas separation means.

4,798,802

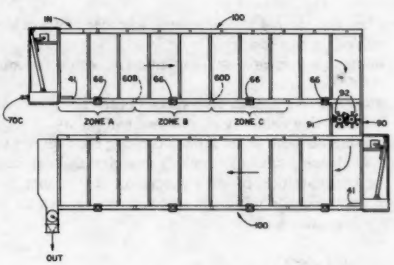
METHOD FOR ACCELERATING COMPOSTING OF ORGANIC MATTER AND COMPOSTING REACTOR THEREFOR

Richard M. Ryan, 37 Fairway Dr., Southgate, Ky. 41071

Filed Jul. 28, 1987, Ser. No. 78,567

Int. Cl.[4] C12M *1/00*

U.S. Cl. 435—313 **29 Claims**



1. A continuous plug-flow composting reactor for organic matter, said reactor comprising:

(a) a longitudinal hollow chamber having a floor, a pair of oppositely disposed side walls, and a top wall;

(b) said floor of said chamber further comprising a plurality of longitudinal slats slidably mounted for longitudinal reciprocation relative said side and top walls of said chamber and located in parallel relationship to one another along the longitudinal chamber;

(c) means for providing aeration gases to the interior of said chamber;

(d) means for exhausting said aeration gases from said chamber to ensure a predetermined flow of such gases through said chamber; and

(e) means for selectively longitudinally reciprocating said slats within said chamber, thereby imposing movement of organic wastes through said reactor within said longitudinal chamber without substantially compressing the organic wastes.

4,798,803

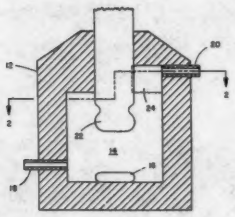
METHOD FOR TITRATION FLOW INJECTION ANALYSIS

Duane K. Wolcott; Ernest D. Graves, Jr., and David G. Hunt, all of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 512,797, Jul. 11, 1983, abandoned, and a continuation-in-part of Ser. No. 753,750, Jul. 10, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 932,811

Int. Cl.[4] G01N *31/16*

U.S. Cl. 436—52 **4 Claims**



1. A method for determining the titration endpoints of at least two independent titratable species by peak width measurement flow injection analysis of a single sample, comprising the steps of:

continuously flowing a stream of carrier liquid;

introducing a multicomponent sample into the carrier stream;

flowing the sample into a mixing and detection cell at a defined carrier flow rate;

forming an exponential dilution gradient within the mixing and detection cell;

titrating with a reactant, each species of the sample mixture, in the mixing cell, to a plurality of end points;

measuring the peak width time of titrating each species to an equivalence point in the mixing chamber and calculating the concentration of each species of the sample in the mixing chamber using the multicomponent system relationship expressed as:

$$T \ln (RF_i) = t_i + T \ln C_i,$$

wherein:

$$t_i = Vm/Q[\ln(Vs/Vm) - \ln C_i] + Vm/Q \ln (S\, n_i\, C_i),$$

and:

t_i are the times to titration endpoints;

V_s is the volume of the sample;

V_m is the mixing cell volume;

Q is the flow rate;

C_i are the molar concentrations of each titratable species in the sample;

n_i are the number of equivalents of each titratable species in the sample;

R is the ratio of sample volume to mixing cell volume:

T is the average cell residence time of titrant;

F_i are the sample concentration functions corresponding to the relationships between the concentrations of C_i, as controlled by the stoichiometry of the species/titrant reactions; and

C_t is the molar concentration of titrant.

4,798,804

SERUM PRETREATMENT IN DIGOXIN IMMUNOASSAY

Pyare Khanna, Fremont, and Fred Pearlman, Union City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 5, 1987, Ser. No. 10,934

Int. Cl.[4] G01N *33/00, 1/18, 33/53*

U.S. Cl. 436—94 **20 Claims**

1. A method for preparing a sample suspected of containing digoxin for determination of digoxin in said sample in an assay, which method comprises:

(a) contacting in a medium a sample with β-cyclodextrin in an amount and under conditions sufficient to allow a substantial portion of digoxin in said sample to bind to said β-cyclodextrin,

(b) separating β-cyclodextrin with digoxin bound thereto from at least one other component of the medium, and

(c) releasing said digoxin from said β-cyclodextrin.

4,798,805

APPARATUS AND PROCESS FOR PYROLYSIS AND ANALYSIS OF SAMPLES CONTAINING ORGANIC MATTER

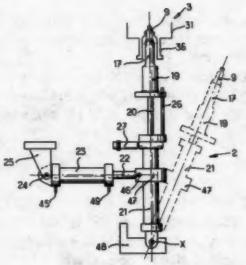
Olivier Issenmann, Lamorlaye, France, assignor to Geoservices, Societe Anonyme, Paris, France

Filed Mar. 28, 1986, Ser. No. 845,684

Claims priority, application France, Apr. 5, 1985, 85 05308

Int. Cl.[4] G01N *25/00, 31/12, 33/24*

U.S. Cl. 436—157 **20 Claims**



6. An apparatus for pyrolyzing and analyzing samples containing organic matter, comprising:

a flow through cartridge constructed and arranged for holding a sample therein, said cartridge including a lower end, an upper end, means defining an inlet in the lower end, and means defining an outlet in the upper end;

a casing;

heating and cooling means disposed within said casing;

supporting and transferring means disposed within said casing for removably supporting the lower end of the cartridge and transferring the upper end of the cartridge into and out of engagement with said heating means by pivoting the cartridge in a vertical plane from a loading position to a position in alignment with said heating means and moving the cartridge from a position at which the upper end of the cartridge is not in contact with the heating means to a position at which the upper end of the cartridge contacts the heating means so that the cartridge can be heated by rapid conductive heating;

carrier gas supply means for supplying a carrier gas to the inlet of the cartridge when the cartridge is supported by the supporting and transferring means;

conduit means for passage of vapors from the outlet of the cartridge when the upper end of the cartridge is held by said supporting and transferring means in contact with said heating means; and

ignition means in fluid communication with said conduit means for igniting a flame, and analysis means for analyzing the chemical composition of a combusted gas from such a flame and for recording the results of such an analysis.

4,798,806

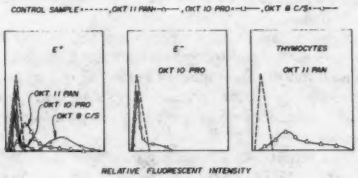
COMPOSITIONS AND METHODS USING A MONOCLONAL ANTIBODY TO A HUMAN T CELL ANTIGEN

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 432,457, Oct. 4, 1982, Pat. No. 4,614,727, which is a division of Ser. No. 110,510, Jan. 8, 1980, Pat. No. 4,364,937. This application Aug. 1, 1986, Ser. No. 892,019

Int. Cl.[4] G01N *33/54*

U.S. Cl. 436—548 **7 Claims**



1. A method for detection of a deficiency or excess of OKT11+ cells in an individual which comprises reacting a lymphocyte composition from said individual with a diagnostically-effective amount of an antibody and measuring the percentage of the population which reacts with said antibody, wherein said antibody is a monoclonal antibody of class IgG produced by a hybridoma formed by a fusion of spleen cells from a mouse previously immunized with leukemic cells from a human with T-ALL and cells from a mouse myeloma line, which antibody:

(a) reacts with essentially all normal human peripheral T cells and with approximately 95% of normal human thymocytes, but not with normal human B cells or null cells;

(b) reacts with early, common and mature human thymocytes and with inducer and cytotoxic/suppressor human T cells, but not with human prothymocytes; and

(c) defines a T cell population which is lower than normal levels in myasthenia gravis and multiple sclerosis; higher than normal levels in acute graft versus host reaction, hyper IGE, acute infectious mononucleosis, and primary biliary cirrhosis; and completely absent in all stages of Hodgkins Disease and psoriasis.

4,798,807

MONOCLONAL ANTIBODIES AND METHOD FOR DETECTING DIOXINS AND DIBENZOFURANS

Martin Vanderlaan, San Ramon; Larry H. Stanker, and Bruce E. Watkins, both of Livermore; Nina Rogers Bailey, Berkeley, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 24, 1986, Ser. No. 877,909

Int. Cl.[4] G01N *33/53*

U.S. Cl. 436—548 **2 Claims**

1. Hybridomas deposited at the American Type Culture Collection under ATCC accession numbers as follows, identified as DD-1 (HB 9741); DD-3, (HB 9742); DD-4, (HB 9743); DD-5, (HB 9744); and DD-6, (HB 9745); which secrete monoclonal antibodies which bind dibenzo-p-dioxins and dibenzofurans.

4,798,808

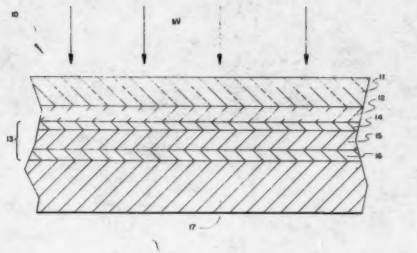
PHOTOCONDUCTIVE DEVICE COONTAINING ELECTROLESS METAL DEPOSITED CONDUCTIVE LAYER

Elliot Berman, Los Angeles, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 11, 1986, Ser. No. 838,737

Int. Cl.[4] H01L *31/18, 21/288*

U.S. Cl. 437—4 **3 Claims**



1. A process for the production of a photoconductive device which comprises:

applying a transparent conductive layer to a transparent insulating substrate;

applying a thin film silicon hydrogen alloy (TFS) photoconductor, the N layer of which comprises n+Si:H alloy, to said transparent conductive layer; and

applying a conductive metal layer to said N layer by immersing the resulting TFS photoconductor applied to a transparent conductive layer applied to a transparent insulating substrate in an electroless metal plating bath maintained at a pH in the range of about pH 7.5 to pH 8.5 at a temperature of about 80° to 95° Celsius for about 1 to 10 minutes, said n+Si:H alloy catalyzing the deposition of an electroless metal deposited film, and removing from said bath a photoconductive device containing a TFS photoconductor having a layer of metal of about 1,000 to 5,000 angstroms in thickness plated only upon said n+Si:H alloy.

4,798,809

PROCESS FOR PREPARING PHOTOELECTROMOTIVE FORCE MEMBER

Masaaki Hirooka, Toridie; Shunichi Ishihara, Ebina; Junichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 938,996

Claims priority, application Japan, Dec. 11, 1985, 60-277004

The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.

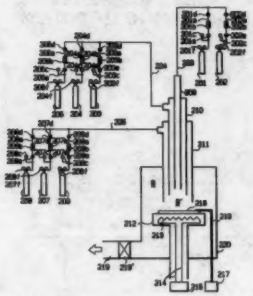
Int. Cl.[4] H01L *31/18, 21/20*

U.S. Cl. 437—4 **6 Claims**

1. In the process for preparing an improved photoelectric force member having a substrate having a conductive surface, a photoelectric conversion layer formed from a film of non-single crystalline semi-conductive material desposited on the conductive surface of the substrate and a conductive layer on said photoelectric conversion layer, the improvement which comprises:

(a) introducing via a first gas transportation conduit into an evacuated film-forming space having said substrate therein gaseous substance (i) capable of being a constituent for said film, but essentially incapable of contributing to the formation of said film in its original energy state; and separately through a second gas transportation conduit concentric with said first gas transportation conduit a gaseous substance (ii) capable of oxidizing the substance (i) said first and second concentric gas transportation conduits terminating adjacent said substrate;

(b) chemically contacting said gaseous substances (i) and (ii) in the absence of a plasma in the space adjacent the surface of said substrate; said substrate being maintained at an elevated temperature to generate a plurality of precursors containing excited precursors and to cause at least one of



said precursors to form the film constituting the photoelectric conversion layer; and

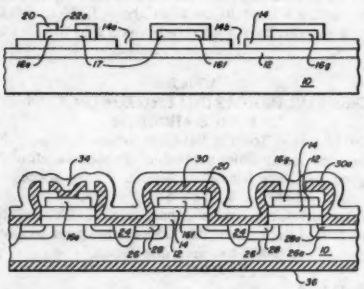
(c) maintaining the distance between the outlet of said first and second concentric gas transportation conduits and the surface of the substrate from 5 mm to 15 cm.

4,798,810

METHOD FOR MANUFACTURING A POWER MOS TRANSISTOR

Richard A. Blanchard, Los Altos, and Adrian Cogan, San Jose, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Filed Mar. 10, 1986, Ser. No. 838,217
Int. Cl.[4] H01L *21/265, 21/22*
U.S. Cl. 437—29 **19 Claims**



1. A process for manufacturing a transistor comprising the steps of:

forming a first insulating layer on a first semiconductor region, said first semiconductor region having a first conductivity type;

forming a conductive gate on said first insulating layer;

forming a second insulating layer on said conductive gate;

forming a mask above said second insulating layer and the portion of said first insulating layer not covered by said conductive gate, said mask having a first window region defining a portion of said second insulating layer and a second window region defining a portion of said first semiconductor region;

introducing impurities into said portion of said first semiconductor region defined by said second window region, thereby forming a second semiconductor region of a second conductivity type within said first semiconductor region, said second semiconductor region serving as a deep body region for said transistor;

forming a third semiconductor region of said second conductivity type within said first semiconductor region, said third semiconductor region being contiguous with said second semiconductor region;

forming a fourth semiconductor region of said first conductivity type within said third semiconductor region; and

forming an opening in said second insulating layer, said opening being defined by said first window said opening serving as a gate contact.

17. A process for manufacturing a transistor comprising the steps of:

forming an insulation layer on a first semiconductor region having a first conductivity type;

forming a conductive gate on said insulation layer;

forming a second semiconductor region having a second conductivity type within said first semiconductor region, said second semiconductor region serving as a transistor body region;

forming a third semiconductor region of said first conductivity type within said second semiconductor region;

forming a fourth semiconductor region of said second conductivity type within said first semiconductor region, said fourth semiconductor region laterally surrounding said transistor;

forming a fifth semiconductor region of said first conductivity type within said fourth semiconductor region; and;

forming a conductive layer over said fifth semiconductor region, said conductive layer being electrically connected to said first, fourth and fifth semiconductor regions, said conductive layer serving as an equipotential ring.

4,798,811

COMBINATION PREPARATION

Hans D. Lehmann, Hirschberg/Leutershausen; Rolf Kretzschmar, Gruenstadt, and Klaus-Juergen Hahn, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 917,049, Oct. 9, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 141,535
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3535950
Int. Cl.[4] A61K *31/60, 31/61, /31/605, 31/615*
U.S. Cl. 514—159 **6 Claims**

1. A pharmaceutical composition for the treatment of circulatory disorders comprising a member selected from the group consisting of verapamil, gallopamil, anipamil, physiologically tolerated salts thereof and mixtures thereof and acetylsalicylic acid in the weight ratio of from 10:1 to 2:1.

4,798,812

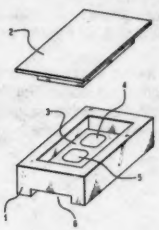
METHOD FOR LIQUID PHASE EPITAXIAL GROWTH

Randall B. Wilson, Maplewood, N.J., assignor to Lytel Corporation, Sommerville, N.J.

Filed Aug. 7, 1987, Ser. No. 83,649
Int. Cl.[4] H01L *21/208*
U.S. Cl. 437—119 **10 Claims**

1. A method of fabricating a solid state electronic device which includes a layer comprising chemically bound phosphorus and arsenic, said method including the step of exposing said device to a temperature and for a time to produce liquid phase epitaxial growth, said step being carried out in the presence of

first and second melts of phosphorus and arsenic in a manner to provide a partial pressure of phosphorus and arsenic respectively to reduce the loss of phosphorus and arsenic from said layer during said step.



4,798,813

CATALYST FOR REMOVING NITROGEN OXIDE AND PROCESS FOR PRODUCING THE CATALYST

Yasuyoshi Kato; Kunihiko Konishi; Toshiaki Matsuda; Meiji Ito; Taiji Kamiguchi; Nobue Teshima, and Hiroshi Akama, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,305

Claims priority, application Japan, Jul. 4, 1986, 61-157448; Oct. 9, 1986, 61-240894; Nov. 14, 1986, 61-271533

Int. Cl.[4] B01J *21/06, 23/72, 29/04, 29/18*

U.S. Cl. 502—60 14 Claims

1. A catalyst for removing nitrogen oxides from exhaust gases comprising titania having a surface area of 20 m^2/g or less and a zeolite having between about 0.01 to about 20% by weight of copper supported thereon, wherein said zeolite has an average pore diameter of 10 Å or less and a silica/alumina molar ratio of 10 or more.

4,798,814

OXIDATION RESISTANT ALUMINA-SILICA ARTICLES CONTAINING SILICON CARBIDE AND CARBON

George F. Everitt; Terence P. Johnson, and Lien-Huong A. Pham, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 912,829, Sep. 26, 1986. This application Aug. 24, 1987, Ser. No. 88,903

The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—89 22 Claims

1. A shaped article comprising a continuous alumina-silica or alumina-boria-silica matrix first phase, an in-situ generated discontinuous carbon second phase, and a discontinuous silicon carbide third phase, said article being stable to an oxidative atmosphere when heated at 1300° C. for at least 2 hours.

4,798,815

NESTED CERAMIC FIBERS AND PIGGYBACK MICRO-MOLD METHOD FOR PRODUCING SAME

Charles C. Fain, Clemson, S.C., assignor to Clemson University, Clemson, S.C.

Division of Ser. No. 004,617, Jan. 20, 1987. This application Sep. 23, 1987, Ser. No. 100,298

Int. Cl.[4] D02G *3/00*; C04B *35/02*

U.S. Cl. 428—373 14 Claims

1. A piggyback method of forming a dual fiber consisting essentially of a ceramic fiber and a micro-mold carrier fiber being a fiber other than a ceramic fiber and to which a wet chemical precursor adheres, by starting with a wet chemical precursor including a metal oxide and being capable of being sintered to form a ceramic material, and an elongated micro-mold carrier fiber having an elongated cavity therein defining a non-circular transverse cross-sectional perimeter, the method consisting essentially of the steps of:

wetting the cavity of the micro-mold carrier fiber with the wet chemical precursor;

setting the wet chemical precursor in the cavity of the carrier fiber until the wet chemical precursor nests in the cavity of the carrier fiber;

placing the carrier fiber with the nested chemical precursor into an oxygen-free environment;

heating the carrier fiber with the nested chemical precursor in the oxygen-free environment to a temperature sufficient to sinter the nested chemical precursor into a ceramic fiber.

4,798,816

PROCESS FOR INCREASING THE SELECTIVITY OF AN ALKYLATION CATALYST FOR MONOALKYLATION

Charles T. Ratcliffe, La Habra, and John W. Ward, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 19, 1986, Ser. No. 943,911

Int. Cl.[4] B01J *29/06, 29/02*

U.S. Cl. 502—62 38 Claims

34. A process for treating an alkylation catalyst comprising a molecular sieve having catalytic acitivity for alkylation and a porous, inorganic refractory oxide, said alkylation catalyst being substantially devoid of hydrogenation metal components, to increase the selectivity of said alkylation catalyst for monoalkylation by at least about 1.0 percentage point, the alkylation activity of said catalyst having been suppressed by the deposition of carbonaceous material thereon to form carbon-containing catalyst particles, which process comprises:

(a) contacting said carbon-containing catalyst particles with a gaseous oxidizing agent comprising between about 0.05 and about 5.0 volume percent oxygen at a temperature between about 750° F. and about 1100° F. to remove a portion of said carbonaceous material and produce a first set of catalyst particles having a reduced carbon content;

(b) increasing the oxygen content of said gaseous oxidizing agent by at least about 0.05 percentage point;

(c) contacting said first set of catalyst particles having a reduced carbon content with said gaseous oxidizing agent of increased oxygen content at about the temperature utilized in step (a) to remove a further portion of said carbonaceous material and produce a second set of catalyst particles having a reduced carbon content as compared with said first set of catalyst particles; and

(d) contacting said second set of catalyst particles with said gaseous oxidizing agent at a temperature between about 850° F. and about 1200° F. that is higher than the temperature used in step (a) while maintaining the oxygen concentration in said gaseous oxidizing agent at about the value used in step (c) until substantially all of said carbonaceous material is removed from said catalyst particles.

4,798,817

SELECTIVE CATALYTIC REDUCTION CATALYST CONSISTING OF IRON SULFATE, CERIA AND ALUMINA

E. Robert Becker, and Hyun J. Jung, both of Wayne, Pa., assignors to Johnson Matthey, Inc., Malvern, Pa.

Division of Ser. No. 874,153, Jun. 13, 1986, Pat. No. 4,695,438. This application Jun. 30, 1987, Ser. No. 69,696

Int. Cl.[4] B01J *27/053, 23/10*; C01B *21/00*

U.S. Cl. 502—217 4 Claims

1. A catalyst consisting essentially of iron sulfate carried by a mixture of ceria and alumina on a support, the ceria comprising from 2–60% by weight of said mixture and the iron sulfate comprising from 0.5–50% by weight of said mixture.

4,798,818

CATALYST COMPOSITION AND PROCESS FOR ITS PREPARATION

William X. Baizer; Robert L. Bixler, Jr.; Michael D. Meddaugh, all of Midland, and Antony P. Wright, Mills Township, Gladwin County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 27, 1987, Ser. No. 125,901
Int. Cl.[4] B01J 27/12, 27/128, 27/132, 27/135
U.S. Cl. 502—228 18 Claims

1. A process for preparing a catalyst, said process comprising

(A) providing aluminum fluoride, said aluminum fluoride having been prepared at a temperature less than about 500° C.;

(B) mechanically mixing, without water, the aluminum fluoride with a transition metal compound selected from a group consisting of compounds of cobalt, chromium, iron, manganese, nickel, titanium, and vanadium; and

(C) contacting the mechanical mixture of aluminum fluoride and the transition metal compound with sufficient gaseous anhydrous hydrogen fluoride to convert the transition metal compound to a transition metal fluoride, said mechanical mixture being heated to a temperature greater than about 150° C. in the presence of anhydrous hydrogen fluoride.

4,798,819

CATALYST FOR CONTROL OF EMISSION OF SULFUR OXIDES

Paul H. Lewis, Groves; Eugene P. Dai, Port Arthur, and Edward H. Holst, Nederland, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 750,213, Jul. 1, 1985, Pat. No. 4,626,419.
This application Mar. 28, 1986, Ser. No. 845,721
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
Int. Cl.[4] B01J 21/04, 23/10, 23/16, 23/26
U.S. Cl. 502—304 7 Claims

1. A composition of matter comprising a porous refractory support bearing as a first component (i) at least one compound containing bismuth, chromium, or a rare earth, said first component being in the form of crystals of oxide of crystal size less than about 90 Angstrom Units, and as second component (ii) at least one alkali metal.

4,798,820

THERMOSENSITIVE RECORDING MATERIAL

Hiroshi Yaguchi, and Hiroshi Sakamoto, both of Numazu, Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,554
Claims priority, application Japan, Aug. 10, 1985, 60-176382
Int. Cl.[4] B41M 5/26
U.S. Cl. 503—207 14 Claims

1. A thermosensitive recording material capable of yielding images thereon by image-wise application of heat thereto comprising:

(a) a support material;

(b) a plurality of undercoat layers overlaid on said support material, each undercoat layer being different and being selected from the group consisting of an undercoat layer (A) comprising a finely-divided filler having an average particle size of 5 μm or less, and a binder agent, and an undercoat layer (B) comprising a wax or wax-like material which can be plastically formed when pressure is applied thereto, and a binder agent; and

(c) a thermosensitive recording layer formed on said undercoat layer, said thermosensitive recording layer comprising one or more leuco dyes and a color developer capable of inducing color formation in said leuco dye when heat is applied thereto.

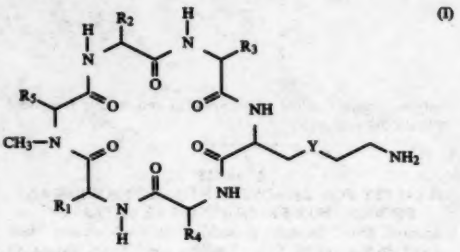
4,798,821

ANTIHYPERTENSIVE THERAPY FOR DIABETICS

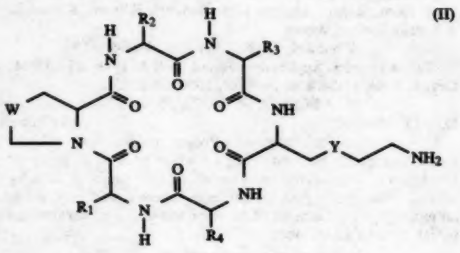
John F. Hartmann, Princeton Junction, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 2, 1987, Ser. No. 20,611
Int. Cl.[4] A61K 37/02; C07K 7/26
U.S. Cl. 514—9 7 Claims

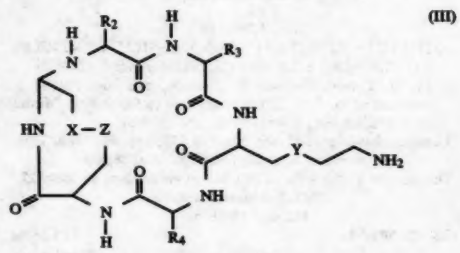
1. A method for reducing blood pressure in diabetic patients comprising administering to a diabetic suffering from elevated blood pressure, an antihypertensive amount of a cyclopeptide compound represented by the formula:



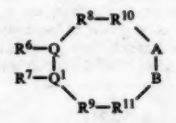
(I)



(II)



(III)



(IV)

and the pharmaceutically acceptable salts thereof, wherein in Formulas I, II and III

Y is $(CH_2)_m$ wherein m is 0, 1 or 2, or sulfur

W is $(CH_2)_n$ wherein n is 0, 1 or 2, or sulfur;

X and Z are independently sulfur or CH_2 provided that at least one of X or Z is sulfur

R_1 and R_2 are independently lower alkyl, benzyl, substituted benzyl wherein the substituent may be one or two of lower alkyl, halogen, hydroxy, amino, nitro or lower alkoxy; and lower alkyl substituted with a 5- or 6-membered heterocyclic ring with 1 or 2 hetero atoms selected from oxygen, nitrogen, and sulfur;

R_3 is 3-indolylmethyl or substituted 3-indolylmethyl

wherein the substituent may be lower alkyl, lower alkoxy or halogen;

R_4 is lower alkyl, hydroxy-lower-alkyl, benzyl, carboxy-lower-alkyl, amino-lower-alkyl or substituted benzyl wherein the substituent may be lower alkyl, lower alkoxy, hydroxy, halogen, amino or nitro; and

R_5 is hydrogen, lower alkyl, benzyl, or substituted benzyl wherein the substituent is lower alkyl, lower alkoxy, hydroxy, halogen, amino or nitro;

in Formula IV

A is (D)-Trp

B is Lys

Q is Cys or Asn; and

Q^1 is Cys or when Q is Asn and R^6 and R^7 are absent is Gaba

R^6 is (D)-Phe, $CH_3(CH_2)_8CO$(D)Phe, or is absent;

R^7 is Thr or is absent or is NH_2, (D)Ser(NH_2), (D)Thr(NH_2), Ser(ol), Phe(ol), (D)Thr(ol), or Thr(ol);

R^8 and R^9 are independently Phe or is absent;

R^{10} is Phe or Thyr; and

R^{11} is Val or Thr;

wherein

Trp is a residue of tryptophan

Lys is a residue of lysine

Cys is a residue of cysteine

Asn is a residue of asparagine

Gaba is a residue of α-aminobutyric acid

Phe is a residue of phenylalanine

Thr is a residue of threonine

Thr(ol) is a residue of threoninol

Ser is a residue of serine

Tyr is a residue of tyrosine

Val is a residue of valine

and (ol) and (NH_2) refer to the alcohol or amine corresponding to the amino acid.

4,798,822

SELECTED 3,9-DI(2,2,6,6-TETRAMETHYL-4-PIPERIDYL)-2,4,8,10-TETRAOXA-3,9-DIPHOSPHASPIRO [5,5]UNDECANES

Michael Rasberger, Riehen; Peter Hofmann, Basle; Hans R. Meier, and Paul Dubs, both of Marly, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

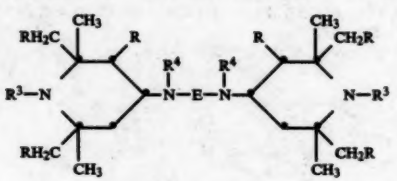
Division of Ser. No. 702,994, Feb. 19, 1985. This application Jan. 29, 1987, Ser. No. 8,433

Claims priority, application Switzerland, Feb. 29, 1984, 964/84

Int. Cl.[4] C07F 9/65

U.S. Cl. 546—15 **3 Claims**

1. A compound of formula II



II

wherein

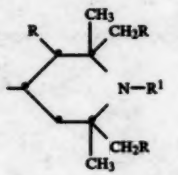
E is a divalent group of formula III

III

R is hydrogen or methyl,

R^3 is hydrogen, C_1–C_{12}-alkyl, C_3–C_5-alkenyl, C_7–C_9-aralkyl, C_2–C_{12}-alkanoyl, C_3–C_6-alkenoyl, benzoyl or cyanomethyl, and

R^4 is C_1–C_{20}-alkyl, C_3–C_{14}-alkoxyalkyl, C_4–C_{12}-dialkylaminoalkyl, C_7–C_9-aralkyl, C_6–C_{10}-aryl, C_7–C_{20}-alkaryl, C_5–C_{12}-cycloalkyl or a group of formula IV



IV

where R^1 is hydrogen, C_1–C_{12}-alkyl, C_3–C_5-alkenyl, C_7–C_9-aralkyl, C_2–C_{12}-alkanoyl, C_{13}–C_6-alkenoyl, benzoyl or cyanomethyl.

4,798,823

NEW CYCLOSPORIN ANALOGS WITH MODIFIED "C-9 AMINO ACIDS"

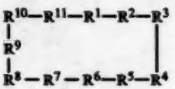
Bruce E. Witzel, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 3, 1987, Ser. No. 57,196

Int. Cl.[4] A61K 37/02; C07K 5/12

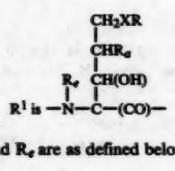
U.S. Cl. 514—11 **19 Claims**

1. A compound of formula



(I)

wherein



where X, R, R_d and R_e are as defined below;

R is

(1) hydrogen;

(2) loweralkyl;

(3) loweralkenyl;

(4) haloloweralkyl;

(5) aryl;

(6) oxyloweralkyl comprising alkoxy lower alkyl and hydroxy lower alkyl;

(7) thioloweralkyl comprising alkyl thio lower alkyl and mercapto lower alkyl;

(8) heteroaryl;

the aryl or hetoroaryl group can be substituted with one or more functional groups selected from a group consisting of

(a) C_{1-6} alkyl,

(b) C_{1-6} alkanoyl;

(c) C_{1-6} haloalkyl;

(d) halo;

(e) cyano;

(f) hydroxy C_{1-3} alkyl;

(g) C_{1-6} alkoxy;

(h)

where n is 0, 1 or 2;

(i) $-NR_bCOR_c$ wherein R_b and R_c independently are H or C_{1-6} alkyl;

(j) $-NO_2$;

(k) $-NR_bR_c$;

(l) $-OR_b$;

(m) $-CONR_bR_c$

(n) $-COR_b$;

(o) $-NR_bCONR_bR_c$;

(p) $-NR_bCOR_c$;

(q) $-OCOR_b$;

(r) $-SCOR_b$; or

(s) $-OCH_2O-$; and

x is S, SO, SO_2, or NR_6.

R_a is loweralkyl;

R_c is loweralkyl; loweralkylphenyl; or aryl;

R^2 is L-2-aminobutyryl; norvalyl; L-threonyl; or R^1;

R^3 is sarcosyl; α-(methylmercapto)-sarcosyl; N-methyl-D-alanyl; N-methyl-L-alanyl; or D-prolyl;

R^4 is N-methyl-L-leucyl;

R^5 is L-valyl; or norvalyl;

R^6 is N-methyl-L-leucyl;

R^7 is L-analyl; L-2-aminobutyryl; or L-phenylalanyl;

R^8 is D-alanyl or L-alanyl;

R^9 is N-methyl-L-leucyl; or N-methyl-L-valyl;

R^{10} is N-methyl-L-leucyl; or L-leucyl; and

R^{11} is N-methyl-L-valyl; L-valyl; N-methylleucyl; or L-2-aminobutyryl.

4,798,824

PERFUSATE FOR THE PRESERVATION OF ORGANS

Folkert O. Belzer, and James H. Southard, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 3, 1985, Ser. No. 784,435

Int. Cl.[4] A61K *31/715, 37/26*

U.S. Cl. 514—60 **8 Claims**

1. A perfusate for the preservation of organs intended for implantation in a patient requiring such implantation, including:

5% hydroxyethyl starch having a molecular weight of from about 200,000 to about 300,000

25mM KH_2PO_4

3mM glutathione

5mM adenosine

10mM glucose

10mM HEPES buffer

5mM magnesium gluconate

1.5mM $CaCl_2$

105mM sodium gluconate

200,000 units penicillin

40 units insulin

16mg Dexamethasone

12mg Phenol Red

pH 7.4–7.5

wherein the hdroxyethyl starch is substantially free of ethylene glycol, ethylene chlorohydrin, sodium chloride and acetone; and the perfusate has an osmolality of about 320 mOSm/1.

4,798,825

PYRETHRUM STABILIZATION BY INACTIVATION OF NATURAL ACETYLENIC IMPURITIES

April J. Evans, Glen Ellyn, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 639,118, Aug. 9, 1984, abandoned. This application Sep. 21, 1987, Ser. No. 98,849

Int. Cl.[4] A01N *65/00*

U.S. Cl. 514—65 **12 Claims**

1. A composition comprising: a mixture of naturally occurring pyrethroid substances and derivatives of naturally occurring polyacetylenic substances wherein said derivatives of polyacetylenic substances are formed by substantially inactivating the acetylenic functional groups to promote the stability of the pyrethroid substances.

4,798,826

BENZODIAZEPINE TRANQUILIZER COMBINATIONS AND THE USE THEREOF

Anthony W. Peck, Bromley, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 644,145, Aug. 24, 1984, Pat. No. 4,571,395, and a continuation of Ser. No. 226,256, Jan. 19, 1981, abandoned. This application Nov. 6, 1985, Ser. No. 795,612

Claims priority, application United Kingdom, Jan. 21, 1980, 8001910

Int. Cl.[4] A61K *31/54, 31/135*

U.S. Cl. 514—221 **5 Claims**

1. A method for the treatment in humans of mixed anxiety and depression comprising the concomitant administration to a human of an effective anxiety treatment amount of a drowsiness-inducing benzodiazepine tranquillizer and m-chloro-α-t-butylamino propiophenone or a pharmaceutically acceptable salt thereof in an amount sufficient to prevent drowsiness caused by the tranquillizer, wherein the benzodiazepine tranquillizer is bromazepam; chlordiazepoxide and pharmacologically and pharmaceutically acceptable salts thereof; chlorazepate and pharmacologically and pharmaceutically acceptable salts thereof; diazepam; medazepam and pharmacologically and pharmaceutically acceptable salts thereof; oxazepam; or prazepam.

4,798,827

SYNERGISTIN DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM

Jean-Claude Barriere, Massy; Claude Cotrel, Paris, and Jean-Marc Paris, Vaires sur Marne, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

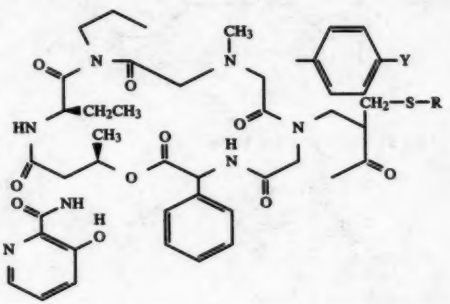
Filed May 21, 1987, Ser. No. 52,371

Claims priority, application France, May 22, 1986, 86 07270

Int. Cl.[4] A61K *37/02, 31/42*; C07K *5/12*; C07D *498/14*

U.S. Cl. 514—183 **7 Claims**

1. A synergistin of the formula:



in which Y is hydrogen or dimethylamino and R is 3- or 4-quinclidinyl, in the form of an isomer or a mixture thereof, and its pharmaceutically acceptable salts.

6. A pharmaceutical composition useful in the treatment of infections of bacterial origin which contains an effective amount of at least one synergistin as claimed in claim 1, in combination with one or more diluents or adjuvants which are compatible therewith and pharmaceutically acceptable.

4,798,828

HETEROCYCLIC-METHYLENE-PENEMS

Neal F. Osborne, Rusper, England, assignor to Beecham Group p.l.c., Middlesex, England

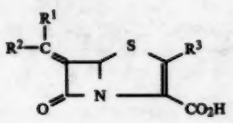
Filed Jan. 24, 1985, Ser. No. 694,607

Claims priority, application United Kingdom, Jan. 26, 1984, 8402085; Jul. 11, 1984, 8417659; Oct. 12, 1984, 8425889

Int. Cl.[4] C07D 499/00; A61K 31/425

U.S. Cl. 514—192 **40 Claims**

1. A compond of formula I:



I

or a pharmaceutically acceptable salt or in vivo hydrolysable ester thereof in which

one of R^1 and R^2 is hydrogen,

the other of R^1 and R^2 is a unsubstituted or substituted five-membered hetero-aromatic ring bonded through a carbon atom thereof and having oen hetero-atom selected from nitrogen, oxygen and sulphur and additionally having from one :o three nitrogen atoms, wherein one or more substituents are (a)(C_{1-6})alkanoyl, (b) (C_{1-6})alkanoyloxy, (c) heterocyclyl, (d) amino, (e) (C_{1-6})alkanoylamino, (f) (mono or di)-(C_{1-6})alkylamino, (g) hydroxy, (h) (C_{1-6})alkoxy, (i)sulpho, (j)mercapto, (k) (C_{1-6})alkylthio, (l)(C_{1-6})alkylsulphinyl, (m) (C_{1-6})alkylsulphonyl, (n) heterocyclylthio, (o) arylthio, (p) sulphamoyl, (g) carbamoyl, (r) amidino, (s) guanidino, (t) nitro, (u) halogen, (v) carboxy, (w) pharmaceutically acceptable carboxy salts, (x) pharmaceutically acceptable carboxy esters, (y)arylcarbonyl or (z) heterocyclylcarbonyl groups, and (aa)unsubstituted or substituted (C_{1-6})alkyl, (C_{2-6})alkenyl, (C_{2-6})alkynyl, aryl, and aryl(C_{1-6})alkyl groups, wherein one or more substitutents for said (aa) groups are (C_{1-6})alkanoyl, (C_{1-6})alkanoyloxy, heterocyclyl, amino, (C_{1-6})alkanoylamino, (mono or di)-(c_{1-6})alkylamino, hydroxy, (C_{1-6})alkylsulphinyl, (C_{1-6})alkysulphonyl, heterocyclylthio, arylthio, suphamoyl, carbamoyl, amidino, guanidino, nitro, halogen, carboxy pharmaceutically acceptable carboxy salts, pharmaceutically acceptable carboxy esters, arylcarbonyl or heterocyclylcarbonyl groups, and

R_3 is hydrogen, (C_{1-10})alkyl or (C_{1-10})alkylthio, or substituted (C_{1-10})alkyl or substituted (C_{1-10})-alkylthio, wherein the substituent is hydroxy, (C_{1-6})alkoxy, (C_{1-6})alkanoyloxy, halogen, mercapto, (C_{1-6})alkylthio, heterocyclylthio, amino, (mono or di)-(C_{1-6})alkylamino, (C_{1-6})alkanoylamino, carboxy, or (C_{1-6})alkoxycarbonyl,

wherein heterocyclyl is aromatic or non-aromatic, having single or fused, rings having up to four hetero-atoms in each ring selected form oxygen, nitrogen and sulphur which rings are unsubstituted or substituted by up to three groups selected from halogen, (C_{1-6})alkyl, (C_{1-6})alkoxy, halo(C_{1-6})alkyl, hydroxy, amino, carboxy, (C_{1-6})alkoxycarbonyl, (C_{1-6})alkoxycarbonyl(C_{1-6})alkyl, aryl, (C_{1-6})alkylthio, arylthio, mercapto and oxo groups, and said aryl is phenyl or naphthyl, wherein each is unsubstituted or substituted by to give groups selelcted form halogen, (C_{1-6})alkyl, phenyl, (C_{1-6})alkoxy, halo(C_{1-6})alkyl, hydroxy, amino, nitro, carboxy, (C_{1-6})alkoxycarobnyl, (C_{1-6})alkoxycarbonyl(C_{1-6})alkyl, (C_{1-6})alkylcarbonyloxy, (C_{1-6})alkylcarbonyl, (C_{1-6})alkylthio, arylthio and mercapto groups.

4,798,829

1-AZABICYCLO[3,2,2]NONANE DERIVATIVES HAVING 5-HT RECEPTOR ANTAGONIST ACTIVITY

Francis D. King, and Karen A. Joiner, both of Harlow, England, assignors to Beecham Group plc., Brentford, Middlesex, England

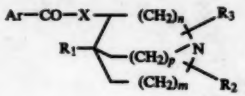
Filed Aug. 14, 1986, Ser. No. 896,664

Claims priority, application United Kingdom, Aug. 16, 1985, 8520616

Int. Cl.[4] A61K 31/55; C07D 487/08

U.S. Cl. 514—214 **13 Claims**

1. A compound of frmula (I) or a pharmaceutically acceptable salt thereof:



(I)

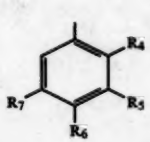
wherein:

n is 2 and m and p are both 1

X is NH; or O when Ar is of formula (a) and R_4 is hydrogen or when Ar is a group of formula (b);

R_1, R_2 and R_3 are independently hydrogen, C_{1-6} alkyl, phenyl or phenyl-C_{1-6} alkyl, which phenyl moieties may be substituted by C_{1-6} alkyl, C_{1-6} alkoxy or halogen;

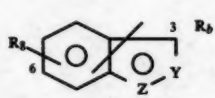
Ar is a group of formula (a):



(a)

wherein either R_4 is C_{1-6} alkoxy and one of R_5, R_6 and R_7 is hydrogen and the other two are selected from hydrogen, halogen, CF_3, C_{1-6} alkylthio, C_{1-7} acyl, C_{1-10} carboxylic acylamino, C_{1-6} alkyl S(O)n wherein n is 0, 1 or 2, nitro or amino, aminocarbonyl or aminosulphonyl optionally substituted by one or two groups selected from C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl C_{1-4} alkyl or phenyl C_{1-4} alkyl groups any of which phenyl moieties may be substituted by one or two groups selected from halogen, CF_3, C_{1-6} alkyl or C_{1-6} alkoxy; or R_4 is hydrogen and R_5, R_6 and R_7 are independently selected from hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio or halo; or any two on adjacent carbon atoms together are C_{1-2} alkylenedioxy and the third is hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy or halo;

or Ar is a group of formula (b):



(b)

wherein

Z is CH_2, O, S or NR_9 wherein R_9 is hydrogen, C_{1-6} alkyl, C_{2-7} alkenyl, phenyl or phenyl C_{1-4} alkyl either of which phenyl moieties may be substituted by one or two of halogen, CF_3, C_{1-6} alkoxy or C_{1-6} alkyl; and Y is CH or N; or Z is CH or N and Y is NR_a or CHR_a where R_a is as defined for R_9 above;

R_b is present when the COX linkage is attached at the phenyl ring, and is selected from hydrogen, halogen, CF_3, hy-

droxy, C_{1-6} alkoxy or C_{1-6} alkyl; R_8 is hydrogen, CF_3, C_{1-5} alkyl, C_{1-5} alkoxy, C_{1-5} alkylthio, C_{1-7} acyl, C_{1-7} acylamino, C_{1-6} alkylsulphonylamino, N-(C_{1-6} alkylsulphonyl)-N-C_{1-4} alkylamino, C_{1-6} alkylsulphinyl, hydroxy, nitro or amino, aminocarbonyl, aminosulphonyl, aminosulphonylamino or N-(aminosulphonyl)-C_{1-4} alkylamino optionally N-substituted by one or two groups selected from C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl C_{1-4} alkyl, phenyl or phenyl C_{1-4} alkenyl groups or optionally N-disubstituted by C_{4-5} polymethylene.

4,798,830

PLATELET AGGREGATION INHIBITORY AGENTS AND INTERMEDIATES THEREFOR

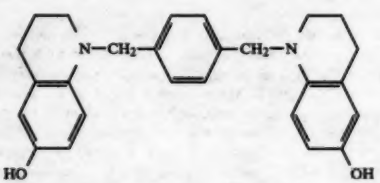
Andrew Lassio, Memphis; Ronald P. Quintana, Germantown; Marion Dugdale, and Randy W. Johnson, both of Memphis, all of Tenn., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 571,326, Mar. 5, 1984, Pat. No. 4,634,209, which is a division of Ser. No. 368,863, Apr. 15, 1982, Pat. No. 4,443,450. This application Sep. 18, 1986, Ser. No. 909,135

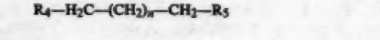
Int. Cl.[4] C07D *401/10, 215/20;* **A61K** *31/47*

U.S. Cl. 514—314 **7 Claims**

1. A compound having the structural formula:



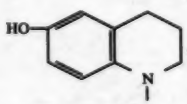
(A)



(B)

wherein

R_4 is



R_5 is H or R_4,

n=4 or 8 when R_5 is H, and

n=8 when R_5 is R_4;

(C) Addition salts thereof with pharmaceutically acceptable acids.

2. A method for the inhibition of blood platelet aggregation comprising administering to an animal in need thereof a blood platelet aggregation inhibiting amount of a compound of claim 1.

4,798,831

SUBSTITUTED THIENO[2,3-B]FURAN-2-SULFONAMIDES AS ANTIGLAUCOMA AGENTS

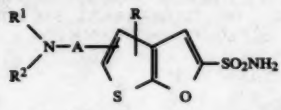
John D. Prugh, Chalfont; George D. Hartman, Lansdale, and Wasyl Halczenko, Hatfield, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 162,545, Mar. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 97,003, Sep. 16, 1987, abandoned. This application May 4, 1988, Ser. No. 190,183

Int. Cl.[4] A61K *31/38;* **C07D** *495/02, 403/00, 421/00*

U.S. Cl. 514—253 **14 Claims**

1. A compound of structural formula:



or pharmaceutically acceptable salt thereof wherein

A is C_{1-8} alkylene, either straight or branched chain and either unsubstituted or substituted with C_{1-3} alkoxy or hydroxy; and

R is hydrogen or C_{1-6} alkyl either straight or branched chain;

R^1 and R^2 are independently:

(1) hydrogen,

(2) C_{1-6} alkyl, either unsubstituted or substituted with one or more of

(a) C_{1-3} alkoxy,

(b) C_{1-3}alkoxy-C_{2-4}alkoxy,

(c) hydroxy,

(d) phenyl, or

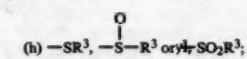
(e) halo,

(f) pyridyl, pyrimidinyl, pyazinyl or imidazolyl, or

(g) $-NR^3R^4$ wherein R^3 and R^4 are independently selected from

(i) hydrogen and

(ii) C_{1-6} alkyl, either unsubstituted or substituted with one or more of C_{1-3} alkoxy, hydroxy or phenyl, or



(h) $-SR^3$, $-\overset{O}{\overset{|}{S}}-R^3$ or $-SO_2R^3$;

(3) taken together with the nitrogen atom to which they are attached form a 5 to 7-membered heterocycle.

4,798,832

PYRIDO[1,2-A]PYRIMIDINE COMPOUNDS, CORRESPONDING INTERMEDIATES AND USE AS SRS-A ANTAGONISTS

Naoto Matsuishi, Kawaguchi; Yoshio Nakagawa, Kasukabe; Michiaki Amano, Koganei; Norihiko Kakehi, Yokohama; Toshio Kawashima, Washimiya, and Shigeki Omura, Tokyo, all of Japan, assignors to Tokyo Tanabe Company, Limited, Japan

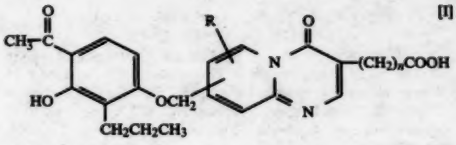
Filed Apr. 13, 1987, Ser. No. 37,786

Claims priority, application Japan, Apr. 16, 1986, 61-86034

Int. Cl.[4] C07D *471/04;* **A61K** *31/505*

U.S. Cl. 514—258 **45 Claims**

1. A pyrido[1,2-a]pyrimidine compound of the formula



[I]

where R is a hydrogen atom, a halogen atom or methyl group, and n is 0, 1 or 2, or a physiologically acceptable salt thereof.

4,798,833

GUANINE DERIVATIVE

Karl N. Johansson, Enhörna; Björn G. Lindborg, Södertälje, and Jan-Olof Norén, Grödinge, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sweden

Continuation of Ser. No. 681,313, Dec. 13, 1984, abandoned. This application Feb. 6, 1987, Ser. No. 15,481

Claims priority, application Sweden, Dec. 20, 1983, 8307051; Dec. 20, 1983, 8307052

Int. Cl.[4] C07D *473/18*; A61K *31/52*

U.S. Cl. 514—262 **3 Claims**

1. A compound having the formula 9-[4-hydroxy-2-(hydroxymethyl)butyl]guanine or a physiologically acceptable salt or an optical thereof.

4,798,834

OPTIONALLY SUBSTITUTED (3β-9,10-DIDEHYDRO-2,3-DIHYDRO ERGOLINE AS SEROTONERGIC FUNCTION ENHANCEMENT

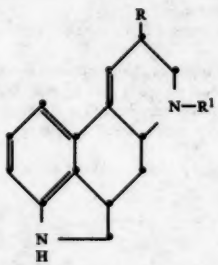
Leander Merritt, and John S. Ward, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 31, 1987, Ser. No. 91,462

Int. Cl.[4] A61K *31/48*; C07D *457/00*

U.S. Cl. 514—288 **27 Claims**

1. A method of enhancing serotonergic function in the nervous system of a mammal in need thereof comprising administering to said mammal a therapeutically effective amount of a compound of the formula:



(I)

wherein R is methyl, hydroxymethyl, methylene, methylthiomethyl, phenylthiomethyl, pyridylthiomethyl, cyanomethyl and methoxycarbonyl; and R^1 is methyl, ethyl or n-propyl.

27. The compound (3β)-2,3-dihydrolysergine.

4,798,835

DL-5-[(2-BENZYL-3,4-DIHYDRO-2H-BENZOPYRAN-6-YL)METHYL]THIAZOLIDINE-2,4-DIONE AS AN ANTI-ATHEROSCLEROSIS AGENT

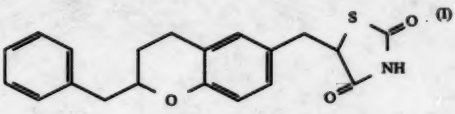
Michael N. Krupp, Old Saybrook, and Archie C. Swindell, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Dec. 2, 1987, Ser. No. 127,858

Int. Cl.[4] A61K *31/425*

U.S. Cl. 514—369 **5 Claims**

1. A method for lowering serum cholesterol levels in a mammal in need thereof which comprises administering to said mammal a serum cholesterol level lowering amount of a compound of the formula



(I)

or a pharmaceutically acceptable cationic salt thereof.

4,798,836

BIS-(2,2,6,6-TETRAMETHYL-PIPERIDYL) DIIMIDES AS LIGHT STABILIZERS FOR SYNTHETIC POLYMERS

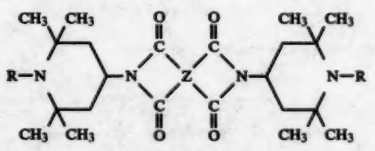
Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Okegawa; Bunji Hirai, Kuki, and Kazuo Sugibuchi, Tokyo, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Oct. 26, 1987, Ser. No. 113,296

Int. Cl.[4] C08K *5/34*; C07D *401/04*

U.S. Cl. 524—89 **16 Claims**

1. Bis-(2,2,6,6-tetramethyl-piperidyl)diimides having the formula:



I

in which R is selected from the group consisting of hydrogen; oxyl; alkyl and alkenyl having from one to about eighteen carbon atoms; epoxy and hydroxyalkyl having from two to about eight carbon atoms; acyl having from two to about eight carbon atoms; and phenalkyl having from seven to about twelve carbon atoms; and Z is a tetravalent aliphatic or cycloaliphatic hydrocarbon group having from two to about eighteen carbon atoms.

4,798,837

BENZOYLPHENYLUREAS

Jozef Drabek, Oberwil, and Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

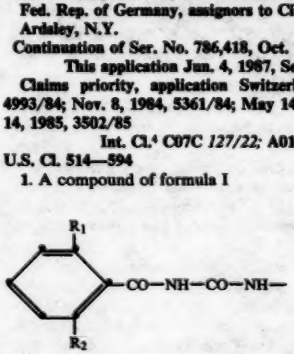
Continuation of Ser. No. 786,418, Oct. 10, 1985, abandoned. This application Jun. 4, 1987, Ser. No. 58,631

Claims priority, application Switzerland, Oct. 18, 1984, 4993/84; Nov. 8, 1984, 5361/84; May 14, 1985, 2048/85; Aug. 14, 1985, 3502/85

Int. Cl.[4] C07C *127/22*; A01N *47/34*

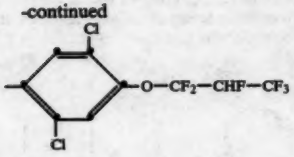
U.S. Cl. 514—594 **13 Claims**

1. A compound of formula I



(I)

-continued



wherein R_1 and R_2 are fluorine, chlorine or methoxy or R_1 is hydrogen and R_2 is chlorine.

4,798,838

CERTAIN PYRIDINYL OR IMIDAZOLINYL-4-THIAZOLYL-PHENOXY ALKANOIC ACID DERIVATIVES HAVING LIPID LOWERING ACTIVITY

Tadao Kojima, Saitama; Shunji Kageyama; Minoru Okada, both of Tokyo; Isao Ohata, and Noboru Sato, both of Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

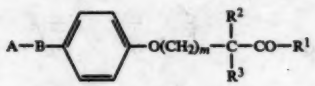
Division of Ser. No. 623,174, Jun. 21, 1984, abandoned. This application Sep. 30, 1986, Ser. No. 913,722

Claims priority, application Japan, Jun. 24, 1983, 58-113988; Oct. 27, 1983, 58-201639; Dec. 26, 1983, 58-248928

Int. Cl.[4] C07D *417/04;* A61K *31/425, 31/44*

U.S. Cl. 514—342 **9 Claims**

1. A phenoxy compound of the formula



wherein A is a 1- or 4-imidazolyl group, a pyridyl group; B is a 4-thiazolyl group which may be substituted with a lower alkyl group; m is 0 or n integer of 1 to 6; R^1 is a hydroxyl group or a lower alkoxy group and R^2 and R^3 which may be the same or different each is a hydrogen atom or a C_{1-3} alkyl group; or a pharmaceutically acceptable salt thereof.

9. A method of lowering lipid activity in a subject in need of such treatment, which comprises administering to said subject a lipid activity lowering amount of a compound of claim 1.

4,798,839

SYNERGISTIC INSECTICIDAL COMPOSITIONS

Hafez M. Ayad, Cary, N.C., assignor to Rhone Poulenc Nederlands B.V., Amstelveen, Netherlands

Continuation-in-part of Ser. No. 363,830, Mar. 31, 1982, abandoned. This application Mar. 7, 1984, Ser. No. 586,961

Int. Cl.[4] A01N *37/34, 43/30, 43/46, 47/28*

U.S. Cl. 514—351 **2 Claims**

1. A synergistic insecticidal composition comprising:

(1) an effective amount of a substituted benzoyl urea compound which is N-(2,6-difluorobenzyl)-N'-[3,5-dichloro-4-(3-chloro-5-trifluoromethylpyridyl-2-oxy)phenyl]urea; and,

(2) an effective amount of a methylenedioxyphenyl compound which is alpha-[2-(2-butoxyethoxy)ethoxy]-4,5-methylenedioxy-2-propyltoluene wherein the weight proportion ratio of the substituted benzoyl urea compound to the methylenedioxyphenyl compound is from about 1:0.05 to about 1:3000 parts by weight respectively.

4,798,840

CORONARY-ACTIVE FLUORINE-CONTAINING 1,4-DIHYDROPYRIDINES

Egbert Wehinger; Horst Meyer; Andreas Knorr, and Stanislav Kazda, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

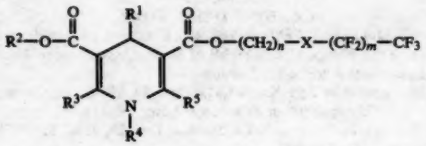
Filed Dec. 4, 1986, Ser. No. 937,764

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544211

Int. Cl.[4] A61K *31/455;* C07D *211/90*

U.S. Cl. 514—356 **11 Claims**

1. A compound of the following formula



in which

R^1 represents phenyl, pyridyl or benzoxadiazolyl, these ring systems being substituted by 1 or 2 identical or different substituents from the group consisting of chlorine, trifluoromethyl, nitro and cyano,

R^2 represents a straight-chain, branched or cyclic hydrocarbon radical which has up to 8 carbon atoms and which is optionally interrupted by an oxygen atom in the chain and or which is optionally substituted by fluorine, cyano, acetoxy, phenyl, phenoxy or α-, β- or γ-pyridyl, or by an amino group, this amino group carrying two identical or different substituents from the group comprising alkyl with up to 4 carbon atoms and benzyl,

R^3 and R^5 are identical or different and each represent a straight-chain or cyclic alkyl radical with up to 6 carbon atoms,

or one of the substituents R^3 or R^5 represents alkyl radical which has up to 4 carbon atoms and is substituted by acetoxy, hydroxyl, phthalimido, amino, phthalimidoethoxy or aminoethoxy,

or one of the substituents R^3 or R^5 represents the formyl or nitrile group,

R^4 represents hydrogen or the morpholinoethyl radical, n is greater than/equal to 1 and m is greater than/equal to 1, and the sum of n and m representing an integer from 5 to 15, and x represents a single bond or the group —N(CH-3)O_2S—,

or a pharmaceutically acceptable acid addition salt thereof.

4,798,841

TETRAHYDROPYRIDINE OXIME CHOLINERGIC AGENTS AND METHOD OF TREATMENT

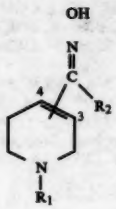
David A. Downs; Walter H. Moos; David W. Moreland, and Haile Tecle, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 31, 1987, Ser. No. 32,839

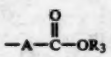
Int. Cl.[4] A61K *31/44;* C07D *213/04*

U.S. Cl. 514—357 **12 Claims**

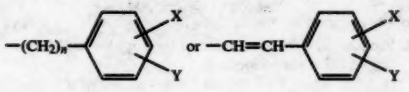
1. A method of treating the symptoms of cognitive decline in the elderly comprising administering a cholinergically effective amount of a compound having the formula



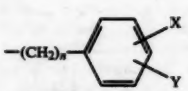
wherein
R_1 is hydrogen;
straight or branched alkyl of from one to six carbon atoms unsubstituted or substituted with hydroxy or alkoxyl of from one to four carbon atoms;
straight or branched alkenyl of from one to six carbon atoms unsubstituted or substituted with hydroxy or alkoxyl of from one to four carbon atoms;
straight or branched alkynyl of from one to six carbon atoms unsubstituted or substituted with hydroxy or alkoxyl of from one to four carbon atoms;
cycloalkyl of from three to eight carbon atoms;



where A is a bond or is a hydrocarbon chain of from one to four carbon atoms, unsubstituted or substituted with halogen, and when containing two or more carbon atoms may contain one double bond and R_3 is alkyl of from one to six carbon atoms; or



where n is zero to four and X and Y are independently selected from
hydrogen,
fluorine,
chlorine,
bromine,
hydroxy,
straight or branched alkyl of from one to three carbon atoms, or
alkoxyl of from one to four carbon atoms;
R_2 is selected from
hydrogen;
straight or branched alkyl of from one to six carbon atoms unsubstituted or substituted with hydroxy or alkoxyl of from one to four carbon atoms;
straight or branched alkenyl of from one to six carbon atoms unsubstituted or substituted with hydroxy or alkoxyl of from one to four carbon atoms;
straight or branched alkynyl of from one to six carbon atoms unsubstituted or substituted with hydroxy or alkoxyl of from one to four carbon atoms;
cycloalkyl of from three to six carbon atoms;



where n is zero to four and
X and Y are independently selected from
hydrogen,
fluorine,
chlorine,
bromine,
hydroxy,
straight or branched alkyl of from one to three carbon atoms, or alkoxyl of from one to four carbon atoms;
or a pharmaceutically acceptable acid addition salt thereof.

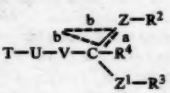
4,798,842

INHIBITORS OF SLOW REACTING SUBSTANCE OF ANAPHYLAXIS

Anil K. Saksena, Upper Montclair; Jesse K. Wong, Union, both of N.J., and Pietro Mangiaracina, Monsey, N.Y., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 866,996, May 19, 1986, Pat. No. 4,758,594, which is a division of Ser. No. 632,143, Jul. 18, 1984, abandoned. This application Nov. 17, 1987, Ser. No. 121,558
Int. Cl.[4] C07C *59/245*
U.S. Cl. 514—381 **6 Claims**

1. A compound having the structural formula III



III

wherein
T is a straight or branched chain alkyl having from 7–15 carbon atoms which may contain from 1–3 noncumulative double or triple bonds;
U is —C≡C—;
V is a straight or branched chain alkylene having from 1 to 4 carbon atoms or is a direct bond;
R^2 and R^3 may be the same or different and are independently selected from CH_2OR^c {wherein R^c is hydrogen, carboxylic acyl having from 1 to 6 carbon atoms, tetrahydropyran-2-yl or $COCH_2CH_2CO_2H$}, CHO, 2-tetrazolyl, COR^d }wherein R^d is hydroxy, alkoxy having from 1 to 6 carbon atoms, $OCH_2OC(O)C(CH_3)_3$ or NHR^e and wherein R^e is hydrogen, alkyl having from 1 to 6 carbon atoms or CH_2CO_2H} or SO_3H, with the proviso that at least one of R^2 and R^3 is 2-tetrazolyl or carboxyl;
Z and Z^1 may be the same or different and are independently selected from straight or branched chain alkylene having from 1 to 12 carbon atoms which may contain from 1 to 3 noncumulative double or triple bonds; and
R^4 is hydrogen, hydroxyl, or is combined with Z to form a double bond as indicated by the dashed line "a" or a cyclopropyl ring as indicated by the dashed lines "b".

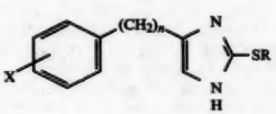
4,798,843

2-MERCAPROIMIDAZOLE DOPAMINE-β-HYDROXYLASE INHIBITORS

Lawrence I. Kruse, Tewin, England, assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jul. 9, 1987, Ser. No. 71,515
Int. Cl.[4] A61K *31/415*; C07D *233/84*
U.S. Cl. 514—392 **18 Claims**

15. A method of inhibiting dopamine-β-hydroxylase activity in mammals that comprises administering an effective amount of a compound of the formula:



in which:

X is H, F, Cl, Br, I, C_{1-4} alkyl, CN, NO_2, SO_2NH_2, COOH, OH, CHO, C_{1-4} alkoxy, CH_2OH, CH_2OC_{1-4} alkyl, CF_3, C_2F_5, C_3F_7, SO_2CH_3, SO_2CF_3, or $CO_2C_nH_{2n+1}$ wherein n is 1–5, or any accessible combination thereof of up to 5 substituents;

R is H or C_{1-4} alkyl; and

n is 0–5; or

any pharmaceutically acceptable salt or hydrate thereof.

4,798,844

CHEMOTHERAPEUTANT COMPOSITION

Takayuki Fujita, Matsushige; Yoshiya Iwasaki, Kitajima, and Hiroko Yabe, Tokushima, all of Japan, assignors to Shikoku Chemicals Corporation, Kagawa, Japan

Filed Apr. 14, 1987, Ser. No. 38,006

Claims priority, application Japan, Feb. 20, 1987, 62-38750; Apr. 4, 1987, 62-82224

Int. Cl.⁴ A61K *31/415*

U.S. Cl. 514—399 **10 Claims**

1. A chemotherapeutic process for remedying infectious diseases caused by pathogenic true fungi or pathogenic bacteria which comprises administering a composition comprising 1-(4-chlorophenyl)-2-(1H-imidazolyl)-3-(2,4-dichlorophenyl)-2-propen-1-one hydrochloride as the effective ingredient and a pharmaceutical additive to a man or animal infected with a pathogenic true fungus or pathogenic bacterium, the amount administered of the effective ingredient being 1 to 300 mg/kg of the body weight per day.

4,798,845

IMIDAZOLE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS FUNGICIDES

Roger B. Pettman, Wychling, and Nicholas S. Wells, London, both of England, assignors to Shell Internationale Research Maatschappij, B.V., The Hague, Netherlands

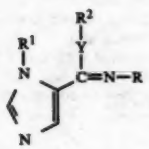
Filed Jul. 9, 1987, Ser. No. 71,454

Claims priority, application United Kingdom, Jul. 14, 1986, 8617083

Int. Cl.⁴ C07D *233/66*; A01N *43/50*

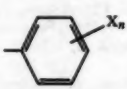
U.S. Cl. 514—400 **9 Claims**

1. A compound of formula



I

or a salt thereof, in which R represents a group of formula



where X is a substituent selected from the group consisting of halogen atoms, trifluoromethyl, methoxy and nitro groups and n is 1 or 2; R^1 represents a C_{1-8} alkyl group; R^2 represents a group of formula $-(CR^4R^5)_m-C\equiv C-R^6$ where m is 1 to 4 and each of R^4, R^5 and R^6 represent a hydrogen atom or a C_{1-8} alkyl group, provided that, when m is 1, R^4 is a hydrogen atom; and Y represents an oxygen or sulphur atom.

7. A method of combating fungus at a locus, which comprises treating the locus with a compound of formula I or a salt thereof as defined in claim 1.

4,798,846

PHARMACEUTICAL COMPOSITIONS

John B. Glen, and Roger James, both of Macclesfield, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 834,292, Sep. 19, 1977, Pat. No. 4,452,817. This application Apr. 4, 1983, Ser. No. 497,768

The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.

Int. Cl.⁴ A61K *31/05*

U.S. Cl. 514—731 **8 Claims**

1. A sterile pharmaceutical composition of the oil-in-water emulsion type, for use as an anaesthetic by parenteral administration to a warm-blooded animal, which comprises in parenterally sterile admixture:

(i) as the oil phase an anesthetically-effective amount of the compound 2,6-diisopropylphenol either alone or dissolved in an oil water-immiscible solvent, said 2,6-diisopropylphenol comprising 1 to 2% by weight of the total composition;

(ii) water; and

(iii) a surfactant of a type and in a sufficient amount to form a homogeneous emulsion of the oil phase and the water, said composition further characterized as being isotonic with the blood.

4,798,847

PROCESS FOR THE PREPARATION OF HYDROPHILIC MEMBRANES AND SUCH MEMBRANES

Hendrik D. W. Roesink; Cornelis A. Smolders, both of Hengelo; Marcellinus H. V. Mulder, Enschede, and Dirk M. Koenhen, Dedemsvaart, all of Netherlands, assignors to X-Flow B. V., Enschede, Netherlands

Filed Sep. 21, 1987, Ser. No. 99,110

Claims priority, application Netherlands, Sep. 23, 1986, 8602402

Int. Cl.⁴ C08G *65/00*

U.S. Cl. 521—50 **13 Claims**

1. Process for the preparation of hydrophilic membrane of a polymer matrix comprising

obtaining a membrane matrix from a solution of at least one hydrophobic polymer, at least one hydrophilic polymer, and a suitable solvent medium,

subjecting the membrane matrix to a coagulation medium,

converting the membrane matrix into an essentially non-swollen membrane matrix, and

cross-linking the hydrophilic polymer which is present in or on the essentially non-swollen membrane matrix such that the hydrophilic polymer is fixed in or on the polymer matrix.

4,798,848

HOT-FOAMABLE, THERMOSETTING EPOXY RESIN MIXTURE

Hermann Dietheim, Giffers, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 5, 1988, Ser. No. 190,326

Claims priority, application Canada, May 13, 1987, 1836/87

Int. Cl.⁴ C08J *9/10*

U.S. Cl. 521—89 **11 Claims**

1. A hot-foamable, thermosetting epoxy resin mixture containing (a) an epoxy resin or a mixture of epoxy resins with an average epoxide content of 4.4 to 5.0 equivalents/kg and an average epoxide functionality of more than 2.0, (b) a novolak with a hydroxyl equivalent weight of 90 to 120, 0.8 to 0.95 hydroxyl equivalents of component (b) being present in the epoxy resin mixture per 1 epoxide equivalent of component (a), (c) 0.1 to 1% by weight, based on the amount of components (a) and (b), of a curing accelerator, (d) 0.5 to 10% by weight, based on the amount of components (a) and (b), of a blowing agent which splits off nitrogen above 100° C. with decomposition, (e) 0.3 to 1% by weight, based on the total amount of the

epoxy resin mixture, of an emulsifier, and if appropriate (f) foam modifiers.

4,798,849

ORGANIC POLYMERS CONTAINING DISPERSED LIQUID CRYSTALLINE FILLER POLYMERS

Oomman P. Thomas, and Robert B. Turner, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 73,038, Jul. 14, 1987, Pat. No. 4,745,135, which is a continuation-in-part of Ser. No. 878,460, Jun. 25, 1986, abandoned. This application Oct. 16, 1987, Ser. No. 109,547

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—114 12 Claims

1. An organic bulk polymer having microscopically dispersed therein a liquid crystalline polymer in an amount sufficient to measurably improve the properties of the organic polymer relative to a like bulk polymer in the absence of the liquid crystalline polymer.

4,798,850

BLENDED-FIBRE FILTER MATERIAL

Richard C. Brown, Dore, England, assignor to National Research Development Corporation, London, England

Filed Apr. 27, 1987, Ser. No. 43,205

Claims priority, application United Kingdom, May 19, 1986, 8612070

Int. Cl.[4] C08L *9/00*

U.S. Cl. 521—134 16 Claims

1. A filter material which comprises a blend of (i) clean polyolefine fibers and (ii) clean fibers of an addition polymer comprising one or more halogen-substituted hydrocarbons.

4,798,851

PROCESS FOR THE PREPARATION OF ELASTIC, NONCELLULAR OR CELLULAR POLYURETHANE- OR POLYURETHANE-POLYUREA MOLDED ARTICLES

Frank Werner, Neustadt; Joachim Streu, Wachenheim, and Herbert Mueller, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 9, 1987, Ser. No. 36,875

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3613650

Int. Cl.[4] C08G *18/30*

U.S. Cl. 521—137 5 Claims

1. A process for the preparation of an elastic, noncellular and/or cellular isocyanate addition polymer molded article comprising reacting:

(a) An organic polyisocyanate;

(b) A high molecular weight polyester polyol;

(c) A chain extending agent in the presence of;

(d) A catalyst

wherein the polyester polyol (b) is liquid at room temperature, has a hydroxyl number from about 25 to 100, an acid number less than about 2 and is produced through the polycondensation of organic dicarboxylic acids and/or anhydrides and polyoxytetramethylene glycol mixtures having a molecular weight of from about 200 to 300.

4,798,852

ULTRAVIOLET CURABLE COATINGS FOR OPTICAL GLASS FIBER

John M. Zimmerman, Des Plaines, and Timothy E. Bishop, Algonquin, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 792,465, Oct. 29, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 7,456

Int. Cl.[4] C08F *2/50, 20/36;* G02B *6/16, 6/22*

U.S. Cl. 522—96 28 Claims

1. A radiation-curable oligomer having a plurality of ethylenically unsaturated terminal groups which contains a plurality of urethane and urea groups and which is formed from components which include: (1) amine functional polymer having a molecular weight of from about 300 to about 4000 and an amine functionality of 3 or 4, or a mixture thereof; (2) hydroxyl or amine functional polymer having a molecular weight of from about 200 to about 4000 and a functionality of two; (3) a monohydric monethylenically unsaturated compound; and (4) organic diisocyanate in an amount sufficient to react with all of the reactive groups in components (1), (2) and (3), said monohydric monoethylenically unsaturated compound being used in an amount to react, via said diisocyanate, with all of the reactive groups on said component (1) less from 10% to 80% of the last reactive group thereon, said components (1) and (2) being present in a molar ratio of from 2:1 to 8:1, and said diisocyanate bonding said polymer components (1) and (2) to provide an oligomer having more than two amine terminated branches which are capped with said monohydric monoethylenically unsaturated compound via said diisocyanate to which said monohydric compound is bonded by a urethane group.

4,798,853

KRATON G THERMOPLASTIC ELASTOMER GEL FILLING COMPOSITION FOR CABLES

Dale L. Handlin, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 687,066, Dec. 28, 1984, abandoned. This application Jan. 20, 1987, Ser. No. 6,287

Int. Cl.[4] H02G *15/00*

U.S. Cl. 523—173 4 Claims

1. A fast forming, thermally reversible encapsulating gel composition for filling hydrophone cables consisting essentially of:

from about 2 percent by weight to about 15 percent by weight styrene-ethylene-butene-styrene block copolymers and from about 85 percent by weight to about 98 percent by weight of a naphthenic or paraffinic oil, or solvent where said oil or solvent has an aromatic content of from about 15 percent by weight to about 25 percent by weight.

4,798,854

PROCESS FOR THE PRODUCTION OF A COMPOSITE MATERIAL BASED ON A POLYMER MATRIX

Mario Visca, Alessandria; Giancarlo Boero, Asti, and Daria Lenti, Alessandria, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Feb. 26, 1987, Ser. No. 19,255

Claims priority, application Italy, Apr. 5, 1985, 20262 A/85; Australia, Apr. 4, 1986, 55676/86; Canada, Apr. 4, 1986, 505873; European Pat. Off., Apr. 4, 1986, 86302517; Japan, Apr. 4, 1986, 76847; Spain, Apr. 4, 1986, 554180; Japan, Aug. 7, 1986, 51-184361

Int. Cl.[4] C08J *3/20, 5/02;* C08K *7/02;* C08L *27/12*

U.S. Cl. 523—334 29 Claims

1. A process for the production of a composite material based on a polymeric matrix comprising homogeneously dispersed therein an organic and/or an inorganic filler, said process comprising mixing together the single components in an aqueous phase, and then coagulating the aqueous composite dispersion thus obtained, characterized in that the single components are in the form of aqueous dispersions in which the

particles have a surface charge of the same sign and a "zeta potential" (in absolute value) between 10 and 100 mV, and the ratio (in absolute value) between the "zeta potentials" of the particles of each dispersion is between 0.2 and 5.

4,798,855

THERMOPLASTIC MOLDING MATERIALS

Dietrich Lausberg, Ludwigshafen; Gerd Blinne, Bobenheim; Peter Ittemann, Ludwigshafen; Gerhard Heinz, Weisenheim; Erhard Seiler, Ludwigshafen, and Manfred Knoll, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed May 13, 1987, Ser. No. 49,226

Claims priority, application Fed. Rep. of Germany, May 24, 1986, 3617501

Int. Cl.[4] C08L 63/02, 77/00, 81/06

U.S. Cl. 523—435 11 Claims

1. A thermoplastic molding material containing, as essential components,

(A) from 2 to 97.9% by weight of a nylon,

(B) from 2 to 97.9% by weight of a polyaryl ether sulfone,

(C) from 0.1 to 30% by weight of a polymeric component having hydroxyl groups said polymeric component being selected from the group consisting of (i) polycondensates of aliphatic or aromatic diols or polyhydric alcohls with epihalohydrins, (ii) polymers and copolymers of vinylphenyl carbinols and vinylphenyldimethyl carbinols, (iii) polymers of vinylphenols, (iv) OH group-containing nylons said nylons being different than the nylons of component (A), (v) OH group-containing polyaryl ether sulfones said sulfones being different than the polyaryl ether sulfones of component (B) and (vi) phenyl/formaldehyde polycondensates and in addition

(D) from 0 to 50% by weight of a rubber impact modifier and

(E) from 0 to 60% by weight of reinforcing fillers.

4,798,856

PIGMENT DISPERSION IN RESIN

Jorge A. Ayala; George A. Joyce, both of Monroe, La., and David Crabbe, St. Louis, Mo., assignors to Columbian Chemicals Co., Atlanta, Ga.

Filed Nov. 6, 1987, Ser. No. 118,216

Int. Cl.[4] C08K 3/10, 5/05, 9/04; C08J 3/20

U.S. Cl. 524—386 12 Claims

1. A pigment concentrate of enhanced dispersibility in plastics comprising a dispersion in a resin carrier of inorganic pigment of the type having a hydrophilic surface selected from the group consisting of divalent ferrite pigment and iron oxide pigment, said pigment including a surfactant selected from the group consisting of trimethylol ethane and trimethylol propane which is functional as a dispersant in a relatively nonpolar matrix and which is present on the surface of the pigment in an effective amount.

4,798,857

COMPLEXES OF BISMUTH OR ANTIMONY HALIDES WITH AMINES, SUITABLE AS FLAME RETARDANTS FOR POLYMERS, AND POLYMER COMPOSITIONS CONTAINING SAME

Guido Bertelli, Ferrara; Patrizia Busi, Portomaggiore, and Renato Locatelli, Ferrara, all of Italy, assignors to HIMONT Incorporated, Wilmington, Del.

Filed Dec. 30, 1987, Ser. No. 139,420

Claims priority, application Italy, Dec. 30, 1986, 22887 A/86; Dec. 30, 1986, 22888 A/86

Int. Cl.[4] C08K 5/34, 5/31; C07F 9/90, 9/94

U.S. Cl. 524—93 20 Claims

1. Complexes of bismuth and antimony halides with amines having formula:

$$Re(MeX_3)_y \quad (I)$$

where

R is an amine selected from the group consisting of 2-guanidinobenzimidazole, isophoronediamine, dicyandiamide, guanamine, melamine, piperzine, all of which may be optionally substituted with an alkyl, aryl or acyl group and a compound prepared from dicyandiamide or melamine having from 2 to 9 triazine rings condensed or linked to each other through at least a —NH— group;

Me is bismuth or antimony;

X is chlorine or bromine; and

y is a number comprised from 0.3 to 4.

9. A polymer composition having flame self-extinguishing properties, comprising by weight:

(a) 85–99.7% of a thermoplastic polymer,

(b) 0.3–15% of a complex or a mixture of complexes of claim 1, and

(c) from 0 to 1% of a free radical promoter provided that when (c) is 0%, component (b) is present in an amount of at least 3% by weight.

4,798,858

FLAME RETARDANT POLYETHERIMIDE ESTER ELASTOMERS

Russell J. McCready; Nan-I Liu, and John A. Tyrell, all of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Mar. 4, 1987, Ser. No. 21,822

Int. Cl.[4] C08K 5/34

U.S. Cl. 524—100 50 Claims

1. A flame retardant composition comprising:

(i) at least one polyetherimide ester resin; and

(ii) a flame retardant effective amount of at least one melamine compound.

4,798,859

POLYHYDROXYL COMPOUNDS CONTAINING ESTER AND ETHER GROUPS AS REACTIVE DILUENTS

Peter Höhlein, Kempen; Eberhard Kreiss; Franz Mory, both of Krefeld, all of Fed. Rep. of Germany, and Bernd Riberi, Pittsburgh, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 14, 1987, Ser. No. 95,928

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632358

Int. Cl.[4] C08L 67/06, 67/02, 67/08

U.S. Cl. 525—7 6 Claims

1. In an alkyd resin-based or oil-free polyester-based lacquer system containing a reactive diluent, the improvement comprises said reactive diluent being the esterification product of

(A) polyols containing on average at least 3 hydroxyl groups per molecule and, per hydroxyl group, an average of 0.5 to 15, but in total no more than an average of 20 ether groups per molecule and

(B) 0.05 to 1.0 equivalent, based on hydroxyl groups of A, of aliphatic saturated or unsaturated monocarboxylic acids containing 8 to 24 carbon atoms per molecule,

with the proviso that the esterification products of A and B have an acid number of at most 5, a hydroxyl number of from 5 to 800 and, on average, from 0.1 to 5 hydroxyl groups per molecule, and a viscosity of at most 1063 mPa.s at 20° C.

4,798,860

FLAME RESISTANT ORGANIC SUBSTANCES CONTAINING POLYMERIC FLAME RETARDANTS

William J. Parr, Naperville, Ill., assignor to Akzo America Inc., New York, N.Y.

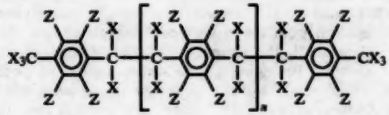
Filed Aug. 21, 1987, Ser. No. 88,166

Int. Cl.[4] C08G 61/02; C08L 65/04

U.S. Cl. 524—409 13 Claims

1. A flame resistant organic substance comprising a synthetic polymer having in intimate contact therewith, by means of

melt blending, a flame retarding amount of a flame retardant compound of the formula:



wherein each x is independently Cl, or Br, each Z in independently Cl, Br, or H and n is at least 500.

4,798,861

SURFACE TREATMENT OF POLYMERS

Ian M. Johnson; Ian M. Moody, and Peter Flesher, all of West Yorkshire, England, assignors to Allied Colloids Limited, England

Filed Nov. 24, 1986, Ser. No. 934,157
Claims priority, application United Kingdom, Nov. 27, 1985, 8529198
Int. Cl.[4] C08F 2/16, 8/00
U.S. Cl. 524—458 9 Claims

1. A process for making polymer particles that are water soluble or swellable and that are cross linked preferentially at their surfaces, the process comprising suspending aqueous droplets of water soluble ethylenically unsaturated monomer or monomer blend and dissolved water soluble cross linking agent in a water immiscible organic solvent containing dissolved solvent-soluble, polyvalent metal, cross linking agent that is soluble in the organic solvent but insoluble in water in an amount sufficient to give at least 40% water, based on the weight of water plus polymer, polymerizing the monomer or monomer blend by reverse phase suspension polymerization to form gel polymer particles the surfaces of which have been reacted with the dissolved solvent-soluble cross linking agent, and then completing the cross linking reaction and drying the particles by azeotropic distillation.

4,798,862

POLYUREAS PREPARED FROM A MIXTURE OF POLYAMINES AND POLYISOCYANATE

Herbert R. Gillis, Jr., Sterrebeek, Belgium, assignor to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 893,165, Aug. 1, 1986, abandoned. This application Jul. 9, 1987, Ser. No. 67,919
Int. Cl.[4] C08G 18/32
U.S. Cl. 524—783 27 Claims

1. A blend of polyamines which consist essentially of

(i) from 25 to 60% by weight of an isocyanate-reactive aromatic polyamine containing one or more aromatic rings; wherein the nitrogen atom of each reactive (primary and/or secondary) amine group is bonded directly to an aromatic ring, the molecular weight of said aromatic polyamine is between 93 and about 400, the reactive amine functionality is between 1.9 and 3.0, the aromatic polyamine is at least 50 mol percent diamines, and at least 60% of the molecular weight of said aromatic polyamine is due to the atoms contained within, or bonded directly to, aromatic rings; and

(ii) from 75 to 40% by weight of an aliphatic polyamine containing acyclic, linear or branched, chains of atoms between isocyanate-reactive (primary and/or secondary) amine groups; wherein the nitrogen atom of each reactive amine group is bonded directly to aliphatic carbon atoms, the molecular weight of said aliphatic polyamine is between 170 and about 500, the reactive amine functionality of said aliphatic polyamine is between 1.9 and 2.5, and at least 50 mol percent of reactive amine containing species in said aliphatic polyamine are diamines,

wherein, in said blend, at least 85% of the active hydrogen-containing groups are primary and/or secondary amine based on the total number of active hydrogen-containing groups in components (i) and (ii), said blend being use as an active hydrogen composition in the manufacture, by a reaction injection molding process, of a polyurea resin having a flexural modulus greater than 200,000 psi.

4,798,863

ZINC TITANATE IN POLY (ARYLENE SULFIDE) COMPOSITIONS

John E. Leland, and Robert J. Martinovich, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 21, 1984, Ser. No. 612,537
Int. Cl.[4] C08K 3/24
U.S. Cl. 524—413 7 Claims

1. A composition comprising poly(arylene sulfide) and zinc titanate.

4,798,864

ELASTOMER POLYOLEFIN BLENDS

Barry Topcik, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 874,450, Jun. 16, 1986, abandoned. This application Oct. 7, 1987, Ser. No. 105,233
Int. Cl.[4] C08L 51/06, 23/26
U.S. Cl. 525—71 9 Claims

1. An elastomer blend consisting essentially of:

(a) a polyolefin selected from the group consisting of (i) polyethylene; (ii) a hydrolyzable copolymer of ethylene and silane; and (iii) a hydrolyzable silane modified polyethylene; and

(b) an ethylene-propylene-diene terpolymer rubber, with or without silane modification, said terpolymer when silane modified being hydrolyzable, provided that, when component (a) is polyethylene, the terpolymer is silane modified,

the blend of components (a) and (b) containing no more than about 40 percent by weight of component (a) based on the combined weight of components (a) and (b) and having the following properties:

(i) Secant Modulus in the range of about 100 psi to about 10,000 psi;

(ii) 100% Modulus in the range of about 100 psi to about 1500 psi; and

(iii) Shore A hardness in the range of about 10 to about 100.

4,798,865

THERMOPLASTIC POLYAMIDE—POLYPHENYLENE ETHER COMPOSITIONS

Thomas S. Grant, Vienna; Ronald L. Jalbert, Woodland Park, and David Whalen, Parkersburg, all of W. Va., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Division of Ser. No. 805,644, Dec. 6, 1985, Pat. No. 4,732,938. This application Jun. 11, 1987, Ser. No. 60,600
Int. Cl.[4] C08L 53/02, 71/04
U.S. Cl. 525—92 2 Claims

1. A composition comprising from 5 to 95 wt % of a polyamide and, correspondingly, from 95 to 5 wt % of a carboxylated phenylene ether resin, and an impact modifier for polyphenylene ether resins, said carboxylated resin being the product of melt-mixing a mixture consisting essentially of 100 parts by weight phenylene ether resin and an ethylenically unsaturated carboxylic acid compound, said impact modifier comprising a hydrogenated styrene-butadiene-styrene block copolymer.

4,798,866

BRANCHED ALPHA-OLEFIN POLYMER COMPOSITION AND PROCESS FOR ITS PRODUCTION

Junichi Yoshitake, Kasuga; Hiroaki Kitani, Waki; Norio Kashiwa, Iwakuni; Takeshi Muranaka, Ichihara; Kenichi Tominari, Iwakuni, and Shigeki Nagamatsu, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 72,670

Claims priority, application Japan, Jul. 14, 1986, 61-163564; Jul. 7, 1987, 61-167892

Int. Cl.[4] C08L *23/18*; C08F *210/14*

U.S. Cl. 525—191 10 Claims

1. A branched alpha-olefinic polymer composition comprising

[I] a branched alpha-olefinic polymer composed substantially of 80 to 100 mole % of (A) recurring units derived from a branched alpha-olefin containing 5 to 10 carbon atoms and having a branch at the 3-position or a position of a higher number and 0 to 20 mole % of (B) recurring units derived from a linear alpha-olefin containing 2 to 20 carbon atoms and having an intrinsic viscosity $[\eta]_H$, determined in decalin at 135° C., of 5 to 30 dl/g, and [II] a branched alpha-olefinic polymer composed substantially of 80 to 100 mole % of (A) recurring units derived from a branched alpha-olefin containing 5 to 10 carbon atoms and having a branch at the 3-position or a position of a higher number and 0 to 20 mole % of (B) recurring units derived from a linear alpha-olefin containing 2 to 20 carbon atoms and having an intrinsic viscosity $[\eta]_L$, determined in decalin at 135° C., of 1 to 10 dl/g;

wherein

the $[\eta]_H/[\eta]_L$ ratio is from 2 to 30, the weight ratio of the polymer [I] to the polymer [II] is from 1/99 to 60/40, said composition has an intrinsic viscosity measured in decalin at 135° C., of 1 to 20 dl/g, and the ratio of the melt flow rate of said composition measured at 260° C. under a load of 5 kg [$MFR^{5kg}_{260°\,C.}$] to its melt flow rate measured at 260° C. under a load of 1 kg [$MFR^{1kg}_{260°\,C.}$] is from 10 to 30.

4,798,867

IMPACT RESISTANT THERMOPLASTIC RESIN COMPOSITION

Yoshio Nakai, Iwakuni, and Masamitsu Tateyama, Yamaguchi, both of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Division of Ser. No. 726,977, Apr. 25, 1985, Pat. No. 4,740,557. This application Dec. 29, 1987, Ser. No. 139,303

Claims priority, application Japan, Apr. 28, 1984, 59-85112

Int. Cl.[4] C08F *8/00, 33/02*

U.S. Cl. 525—196 9 Claims

1. An impact resistant thermoplastic resin composition comprising a graft copolymer II obtained by:

(i) emulsion-polymerizing a monomer mixture (a) comprising 51% to 99% by weight of an alkyl acrylate having 2 to 8 carbon atoms in the alkyl group and 49% to 1% by weight of 1,3-butadiene to obtain a rubbery copolymer I in the form of a latex;

(ii) enlarging the particles of the rubbery copolymer I to an enlarged rubber copolymer I' by adjusting adjust the average particle size to 0.12 to 0.4 μm by the addition of:

(A) an acid group-containing copolymer in the form of a polymer latex obtained by emulsion polymerizing a monomer mixture (b) comprising 3% to 40% by weight of at least one unsaturated acid monomer selected from the group consisting of acrylic acid, methacrylic, crotonic acid, cinnamic acid and sorbic acid, 97% to 35% by weight of an alkyl acrylate having 1 to 12 carbon atoms in the alkyl group, and 0% to 40% by weight of other copolymerizable monomer, according to an at least two stage polymerization process including the stages of first polymerizing a portion occupying 5% to 90% by weight of the monomer mixture (b) but not containing the unsaturated acid monomer and subsequently polymerizing the remaining portion occupying 95% to 10% by weight of the monomer mixture (b) and containing the unsaturated acid monomer, and

(B) at least one salt of an oxyacid having a central element selected from the group consisting of the elements of Groups III, IV, V, and VI of the periodic table, said elements belonging to the second and third periods, with a metal selected from the group consisting of alkali metals, alkaline earth metals, zinc, nickel, and aluminum,

the total amount of the acid group-containing copolymer (A) and the oxyacid salt (B) being in the range of 0.1 to 5 parts by weight based on 100 parts by weight of the solid polymer constituent in the latex of the rubbery copolymer I and the proportion of the acid group-containing copolymer (A)/the oxyacid salt (B) being 1/(0.01 to 10) by weight; and

(iii) polymerizing in the presence of 100 parts by weight of the solid polymer constituent in the latex of the enlarged rubbery copolymer I' 10 to 1000 parts by weight of a monomer mixture (c) comprising 50% to 100% by weight of at least one monomer selected from the group consisting of methyl methacrylate and styrene and 50% to 0% by weight of other monofunctional copolymerizable monomer.

4,798,868

TERNARY BLENDS OF POLYVINYL CHLORIDE

Frank E. Lordi, West Chester, Pa., and Peter J. Vanderpool, Cherry Hill, N.J., assignors to Arco Chemical Company, Newtown Square, Pa.

Filed Aug. 6, 1987, Ser. No. 82,260

Int. Cl.[4] C08L *35/06, 39/04*

U.S. Cl. 525—207 4 Claims

1. A moldable polyblend comprising 60 to 70 wt-% based on total polyblend of a polyvinyl chloride resin and 20 to 30 wt-% based on total polyblend of a non-equimolar copolymer of less than 50 mole-percent of an unsaturated dicarboxylic acid moiety and at least 50 mole-percent of at least one monomer copolymerizable therewith, and 10 to 20 wt-% based on total polyblend of interfacial modifier.

4,798,869

PROCESS FOR THE PRODUCTION OF THERMOPLASTIC COMPOSITIONS AND COMPOSITIONS PRODUCED THEREBY

Harald Sturm; Rolf-Walter Terwonne, and Dieter Thunig, all of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Nov. 7, 1986, Ser. No. 927,985

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539414

Int. Cl.[4] C08F *265/04, 267/06*

U.S. Cl. 525—305 21 Claims

1. A process for the production of a thermoplastic composition for molded parts having improved impact resistance, transparency, surface gloss, and weatherability and formed of a hard inner core of crosslinked polystyrene, a rubber-elastic intermediate layer of crosslinked polyacrylic ester, and an outer layer of polyvinyl chloride,

wherein the inner core thereof is produced by the steps of:

(a) forming a mixture, before or after addition of an initiator effective to initiate polymerization, under polymerization conditions in the presence of an emulsifier, of 0.01–5.0% by weight of an acrylic acid or methacrylic acid alkyl ester with a crosslinking component whereby polymerization is effected, and thereafter

(b) adding to the mixture, 20–70% by weight of a mixture of an aromatic vinyl monomer with a crosslinking component and, simultaneously therewith in a separate stream, a solution of an organic complexing agent and

of an emulsifier in water, and emulsion polymerizing the resultant mixture;

wherein the intermediate layer thereof is produced by adding, to the inner core produced in step (b),

(c) 79.99–25% by weight of a mixture of an acrylic acid alkyl ester with a crosslinking component and simultaneously therewith an aqueous emulsifier solution, under emulsion polymerization conditions;

wherein said amounts in steps (a), (b) and (c) are based on the total amount of the composition resulting from said steps; and

wherein the outer layer thereof is formed on the thus-produced core/shell polymer by adding, to 50 to 2 parts by weight thereof,

(d) 50 to 98 parts by weight of vinyl chloride or a monomer mixture containing predominantly vinyl chloride,

wherein the amounts of said core/shell polymer and said monomer or mixture of step (d) are based on the total amount thereof,

with agitation, and in the presence of an initiator effective to initiate polymerization, the agitating temperature and period selected so that polymerization occurs with a conversion, based on the monomer mixture or, respectively, the vinyl chloride, up to 10% by weight, and thereafter continuing the polymerization by heating to the polymerization temperature, to a vinyl chloride conversion of 65–95%.

4,798,870

REACTIVE SURFACE FOR DECONTAMINATION

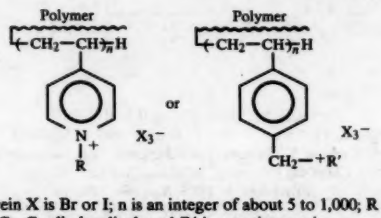
Robert E. Lyle, Jr., San Antonio, and Henry F. Hamil, New Braunfels, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Continuation-in-part of Ser. No. 659,183, Oct. 9, 1984, abandoned. This application Dec. 4, 1986, Ser. No. 937,911

Int. Cl.⁴ C08F *8/18*

U.S. Cl. 525—327.1 **11 Claims**

1. A regenerative reactive article comprising a polymer surface having attached thereto a hydrohalide-polyhalide or quarternary halide-perhalide salt corresponding to the formula:



wherein X is Br or I; n is an integer of about 5 to 1,000; R is H or a C_1–C_3 alkyl radical, and R′ is a tertiary amine.

4,798,871

COMPOSITIONS CONTAINING HIGH MOLECULAR WEIGHT POLY(VINYLAMINES) FOR ENHANCED OIL RECOVERY

Ta-Wang Lai, Allentown, and Bheema R. Vijayendran, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 914,046, Oct. 1, 1986. This application Jun. 19, 1987, Ser. No. 64,967

Int. Cl.⁴ C08F *8/12*

U.S. Cl. 525—328.2 **13 Claims**

1. An enhanced oil recovery composition consisting essentially of sea water containing 500 to 2500 ppm by weight poly(N-vinylamide) of at least 10^6 average molecular weight and greater than 50% hydrolyzed to vinylamine units, the composition having a 5 to 25 cps Brookfield viscosity at 7.9 sec^{-1} and 90° C.

4,798,872

ALKYLENE PHOSPHONATE ACID ESTER POLYOLS

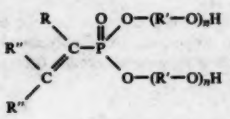
Anil B. Goel, and Biau-Hung Chang, both of Worthington, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 28, 1986, Ser. No. 856,550

Int. Cl.⁴ C07F *9/40*; C08G *18/00*

U.S. Cl. 558—186 **2 Claims**

1. An alkenyl phosphonic acid ester polyol composition having the formula



wherein n represents a number of from 1 to 50, R is an alkyl group having from 1 to 10 carbon atoms or a phenyl group, R′ is an alkylene group having from 2 to 4 carbon atoms and R″ independently represents hydrogen or an alkyl group having from 1 to 10 carbon atoms.

4,798,873

POLYOLEFINECARBOXYLIC ACIDS, THEIR PREPARATION AND THEIR USE FOR PREPARING POLYOLEFINE-POLYCARBONATE BLOCK COPOLYMERS

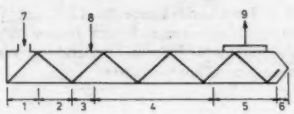
Kurt P. Meurer; Helmut Waniczek, both of Cologne; Gerd Sylvester, Leverkusen, and Josef Witte, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 14, 1987, Ser. No. 50,165

Claims priority, application Fed. Rep. of Germany, May 31, 1986, 3618378

Int. Cl.⁴ C08F *10/00*

U.S. Cl. 525—333.7 **5 Claims**



1. A poly-(C_2-C_{10}-α-olefine)carboxylic acid having a molecular weight $\overline{M}w$ ($\overline{M}w$ determined by coupling of gel permeation chromatography and viscometry) of 2,000 to 350,000.

4,798,874

THERMOPLASTIC BLENDS COMPRISING POLYCARBONATE RESIN AND AMORPHOUS POLYAMIDE

Louis M. Maresca, Pittsfield; Donald C. Clagett, Lincoln, and Uwe S. Wascher, Pittsfield, all of Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 812,433, Dec. 23, 1985, abandoned. This application Apr. 11, 1988, Ser. No. 183,308

Int. Cl.⁴ C08L *69/00, 77/00*

U.S. Cl. 525—425 **10 Claims**

1. A blend of thermoplastic resins consisting essentially of:

(i) at least one aromatic polycarbonate resin; and

(ii) at least one amorphous polyamide resin having no distinct melting point.

4,798,875

BIAXIALLY ORIENTED POLYESTER FILM

Kuniyoshi Itoyama; Norihiro Horita; Shigemi Seki, and Satoyuki Minami, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

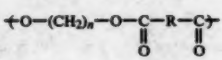
PCT No. PCT/JP86/00158, § 371 Date Dec. 1, 1987, § 102(e) Date Dec. 1, 1987, PCT Pub. No. WO87/05919, PCT Pub. Date Oct. 8, 1987

PCT Filed Apr. 1, 1986, Ser. No. 141,340

Int. Cl.[4] C08L *67/02*

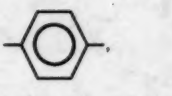
U.S. Cl. 525—444 11 Claims

1. A biaxially oriented polyester film composed mainly of a polymer blend comprising [A] a polyester having recurring units of the following general formula (I);

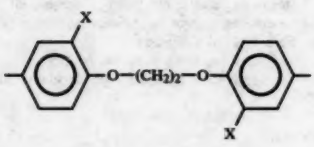


(I)

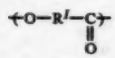
wherein n is 2, 4 or 6 and R is at least one member selected from the group consisting of



and

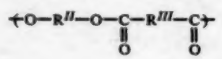


in which X is H or Cl and at least one X is Cl, and [B] a copolyester having units represented by the general formula (I) and units represented by the following general formula (II) and/or the following general formula (III):



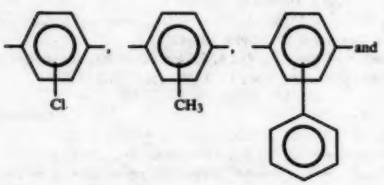
(II)

and/or



(III)

wherein R^I, R^{II} and R^{III} stand for at least one member selected from the group consisting of 1,3-phenylene, 1,4-phenylene, 2,6-naphthalene, 2,7-naphthalene,



and having a flow-initiating temperature not higher than 350° C. and a melt anisotropy-forming capacity, the molar ratio of the units represented by the general formula (II) and/or the general formula (III) being 0.5 to 18 mole % based on the total polyblend, wherein one plane of the crystal of the polyester [A] is plane-oriented in the film surface, the in-plane orientation index is 0.75 to 0.95, and the crystal size in said crystal plate direction is 35 to 75 Å.

4,798,876

HYDROPHILIC POLYURETHANE COMPOSITION

Francis E. Gould; Ellen K. Morgan, both of Princeton, and Stephen D. Reduker, Somerset, all of N.J., assignors to Tyndale Plains-Hunter Ltd., Princeton, N.J.

Filed Nov. 12, 1985, Ser. No. 797,407

Int. Cl.[4] C08F *283/04*

U.S. Cl. 525—457 7 Claims

1. A water absorptive polyurethane composition comprising by weight a physical blend of A. about 25% to about 75% of a hydrophilic polyether polyurethane which is the reaction product of diethylene glycol and a polyoxyethylene glycol having a molecular weight of about 1000 to about 8000 with a polyisocyanate and B. about 75% to about 25% of a hydrophobic polyester polyurethane which is the reaction product of a polyfunctional polyester, derived from the condensation of a polyol with a polybasic acid, with a polyisocyanate.

4,798,877

RADIATION-CURABLE RESINS

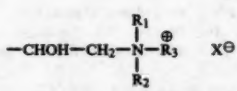
Dwight K. Hoffman; Robert F. Harris, both of Midland, Mich., and Richard A. Hickner, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 8, 1985, Ser. No. 720,769

Int. Cl.[4] C08F *283/10*

U.S. Cl. 525—531 13 Claims

1. A water-compatible, radiation-curable, resinous composition comprising (1) molecules containing ester groups resulting from the esterification of an epoxy compound and an unsaturated carboxylic acid having a dissociation constant of at least 1×10^{-7} and (2) molecules containing groups of the reaction product of an epoxy compound, a secondary or tertiary amine and an acid and having the structure:



wherein R_1 and R_2 are independently hydrocarbon or inertly substituted hydrocarbon having 1 to 12 carbon atoms; R_3 is hydrogen or hydrocarbon or inertly substituted hydrocarbon and X is the anion of an inorganic or organic acid.

4,798,878

SYNTHETIC RESIN COMPOSITIONS SHELF-STABLE UNDER EXCLUSION OF MOISTURE

Bernd Brinkmann, Nordkirchen, and Hermann-Josef Lucas, Ascheberg-Herbern, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

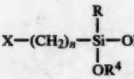
Filed Jul. 19, 1985, Ser. No. 756,626

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3426987

Int. Cl.[4] C08L *91/00*

U.S. Cl. 528—28 **21 Claims**

1. A polymer which is the product of polymerizing a polyether urethane containing free NCO groups with an ether alkoxysilane of the general formula



wherein

X is —SH, or —NHR^2,

R is $—CH_3$, $—C_2H_5$, or $—OR^1$,

R^1 is $—(CH_2—CH_2—O)_mR^3$,

R^2 is H, $—CH_2—CH_2—NH_2$ or a C_{1-10}-aliphatic, C_{3-10}-cycloaliphatic or C_{6-10} aromatic, hydrocarbon group of 1–10 carbon atoms,

R^3 is C_{1-10}-alkyl or hydrocarbon C_{6-10}-aryl,

R^4 is C_{1-4}-alkyl or one of the R^1 groups,

n is 1–6

m is 1–30.

4,798,879

CATALYZED FAST CURE POLYURETHANE SEALANT COMPOSITION

Steven L. Hannah, Chagrin Falls; Maureen R. Williams, Warrensville Hts., and Thomas W. Greenlee, Shaker Heights, all of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Mar. 25, 1987, Ser. No. 30,773

Int. Cl.[4] C08G *18/81, 18/08, 18/10*

U.S. Cl. 528—45 **10 Claims**

1. A curable polyurethane composition, comprising, a polyurethane prepolymer component, said polyurethane prepolymer component made from a polyester polyol, a polybutadiene polyol, or a poly(oxyalkylene) polyol and an aromatic polyisocyanate, said alkylene group of said poly(oxyalkylene) polyol having from 2 to 6 carbon atoms said polyurethane prepolymer having blocked isocyanate groups,

a curing agent component, said curing agent component comprising an amine curing agent containing at least two primary amines, and an effective amount of a bicyclic amidine catalyst or a derivative thereof capable of unblocking said blocked isocyanate groups.

4,798,880

SPANDEX FORMED WITH A MIXTURE OF DIAMINES

Gary A. Lodoen, Fishersville, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1987, Ser. No. 139,841

Int. Cl.[4] D02G *3/00*

U.S. Cl. 528—63 **4 Claims**

1. An improved shaped article of a spandex polymer formed from polyalkaneether glycol that was capped with tertiary aralkyl diisocyanate and then chain extended with diamine, wherein, for increased heat-settability, the improvement comprises

the chain-extending diamine being a mixture that consists essentially of

25 to 80% of hydrogenated m-phenylenediamine,

10 to 50% of hydrogenated p-phenylenediamine and

10 to 30% of tetrachloro-p-xylylenediamine, all percentages being molar percent.

4,798,881

NOVEL POLY(ARYLENE ETHER-AMIDE) POLYOLS AND THEIR APPLICATION IN POLYURETHANE POLYMERS

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 48,711, May 12, 1987, Pat. No. 4,739,031. This application Feb. 1, 1988, Ser. No. 150,852

Int. Cl.[4] C08G *18/28, 18/77*

U.S. Cl. 528—73 **11 Claims**

1. The process for preparing a polyurethane comprising copolymerizing a mixture of poly(arylene ether-amide), produced by the reaction of a bicyclic amide acetal and a polyphenolic compound, and a polyisocyanate.

4,798,882

BRANCHED POLYCARBONATE FROM METHYLENE-BIS-NAPHTHALENE COMPOUND

Alberto Petri, Milan, assignor to Enichem Tecnoresine S.p.A., Milan, Italy

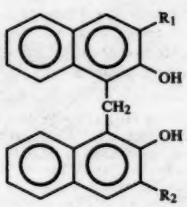
Filed Jul. 17, 1987, Ser. No. 75,042

Claims priority, application Italy, Jul. 23, 1986, 21233 A/86

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—190 **17 Claims**

1. Thermoplastic, blow moldable, branched polycarbonate derived from at least one aromatic dihydroxy compound, phosgene, and a branching agent methylene-bis-naphthalene compound having the formula:



(I)

wherein R_1 and R_2, are the same or different from each other, and represent —COOH or COCL.

4,798,883

MODIFIED POLYETHYLENE NAPHTHALATE

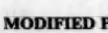
William C. T. Tung, Tallmadge, and Merry E. Floyd, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 1, 1988, Ser. No. 176,555

Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—272 **19 Claims**

1. A polyester consisting essentially of repeat units which are derived from (a) a naphthalene dicarboxylic acid and (b) a diol component which is comprised of (1) at least one glycol containing from 2 to 12 carbon atoms and (2) from about 1 to about 12 weight percent of at least one polyester glycol based upon the total weight of the polymer wherein said polyether glycol has the structural formula:



wherein A is an alkylene group containing from 2 to about 8 carbon atoms and wherein n is an integer from 2 to about 400.

4,798,884
PROCESS FOR THE WORKING-UP OF ETHYLENE/CARBON MONOXIDE ALTERNATING COPOLYMERS

Henricus M. J. Brons, and Maarten M. Geuze, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 23, 1986, Ser. No. 945,594
Claims priority, application Netherlands, Dec. 23, 1985, 8503545
Int. Cl.[4] C08G 67/02
U.S. Cl. 528—491 9 Claims

1. A process for working up a linear alternating copolymer of carbon monoxide and ethylene which process comprises washing the copolymer in the absence of molecular oxygen with an organic solvent selected from the group consisting of aliphatic alcohols, ketones, ethers, nitriles and saturated hydrocarbons, separating the copolymer from the solvent and drying the copolymer at a temperature of at least (T-30)°C., wherein T is the boiling point of the solvent at room pressure, in the absence of molecular oxygen and in the absence of water.

4,798,885
COMPOSITIONS OF HORMONALLY ACTIVE HUMAN AND PORCINE INHIBIN CONTAINING AN α CHAIN AND 62 CHAIN

Anthony J. Mason, and Peter H. Seeburg, both of San Francisco, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 827,710, Feb. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 783,910, Oct. 3, 1985, abandoned. This application Dec. 31, 1986, Ser. No. 906,729
Int. Cl.[4] C07K 13/00
U.S. Cl. 530—350 24 Claims

1. A composition comprising hormonally active human inhibin as a product of recombinant host cell expression, the human inhibin containing an α chain and a β chain wherein the α chain has the amino acid sequence

Ser Thr Pro Leu Met Ser Trp Pro Trp Ser Pro Ser Ala Leu Arg Leu Leu Gln Arg Pro Pro Glu Glu Pro Ala Ala His Ala Asn Cys His Arg Val Ala Leu Asn Ile Ser Phe Gln Glu Leu Gly Trp Glu Arg Trp Ile Val Tyr Pro Pro Ser Phe Ile Phe His Tyr Cys His Gly Gly Cys Gly Leu His Ile Pro Pro Asn Leu Ser Leu Pro Val Pro Gly Ala Pro Pro Thr Pro Ala Gln Pro Tyr Ser Leu Leu Pro Gly Ala Gln Pro Cys Cys Ala Ala Leu Pro Gly Thr Met Arg Pro Leu His Val Arg Thr Thr Ser Asp Gly Gly Tyr Ser Phe Lys Tyr Glu Thr Val Pro Asn Leu Leu Thr Gln His Cys Ala Cys Ile

and the β chain is selected from the βA chain sequence

Gly Leu Glu Cys Asp Gly Lys Val Asn Ile Cys Cys Lys Lys Gln Phe Phe Val Ser Phe Lys Asp Ile Gly Trp Asn Asp Trp Ile Ile Ala Pro Ser Gly Tyr His Ala Asn Tyr Cys Glu Gly Glu Cys Pro Ser His Ile Ala Gly Thr Ser Gly Ser Ser Leu Ser Phe His Ser Thr Val Ile Asn His Tyr Arg Met Arg Gly His Ser Pro Phe Ala Asn Leu Lys Ser Cys Cys Val Pro Thr Lys Leu Arg Pro Met Ser Met Leu Tyr Tyr Asp Asp Gly Gln Asn Ile Ile Lys Lys Asp Ile Gln Asn Met Ile Val Glu Glu Cys Gly Cys Ser

or the βB chain sequence

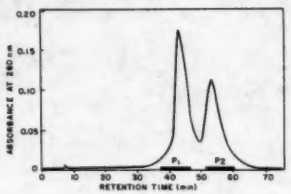
Gly Leu Glu Cys Asp Gly Arg Thr Asn Leu Cys Cys Arg Gln Gln Phe Phe Ile Asp Phe Arg Leu Ile Gly Trp Asn Asp Trp Ile Ile Ala Pro Thr Gly Tyr Tyr Gly Asn Tyr Cys Glu Gly Ser Cys Pro Ala Tyr Leu Ala Gly Val Pro Gly Ser Ala Ser Ser Phe His Thr Ala Val Val Asn Gln Tyr Arg Met Arg Gly Leu Asn Pro Gly Thr Val Asn Ser Cys Cys Ile Pro Thr Lys Leu Ser Thr Met Ser Met Leu Tyr Phe Asp Asp Glu Tyr Asn Ile Val Lys Arg Asp Val Pro Asn Met Ile Val Glu Glu Cys Gly Cys Ala;

and hormonally active, substantially homologous amino acid sequence variants of said human inhibin other than porcine inhibin.

4,798,886
MUTUAL SEPARATION OF PROTEINS

Koichi Kato, Kawabe; Takao Yamada, Matsubara, and Kenji Kawahara, Izumi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 12, 1987, Ser. No. 25,269
Claims priority, application Japan, Mar. 24, 1986, 61-066399
Int. Cl.[4] C07K 3/18
U.S. Cl. 530—416 17 Claims



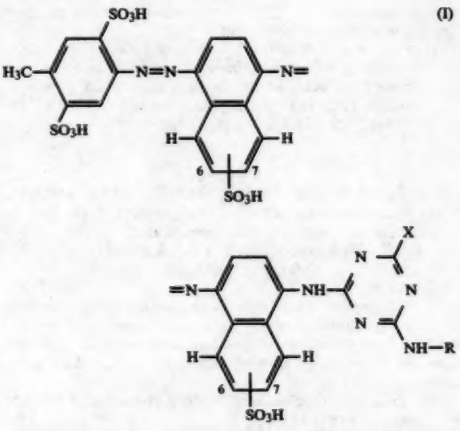
1. A method of mutually separating a protein or a Met-protein from a mixture comprising the protein and Met-protein, which comprises subjecting the mixture to a separation procedure utilizing the difference in the affinity for hydroxyapatite between the protein and the Met-protein.

4,798,887
AZO DYES OF METHYLANILINE DISULFONIC ACID COUPLED WITH NAPHTHYLAMINE SULFONIC ACID

Heinz Krueger, Limburgerhof; Hartmut Lardon, Ludwigshafen, and Manfred Patsch, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Apr. 29, 1986, Ser. No. 857,051
Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517366
Int. Cl.[4] C09B 62/09, 62/513; D06P 1/382, 3/66
U.S. Cl. 534—637 1 Claim

1. A compound which, in the form of the free acid, is of the formula (I):



(I)

wherein X is chlorine; and R is hydrogen, vinylsulfonylphenyl,

β-sulfatoethylsulfonylphenyl, vinylsulfonylbenzyl, sulfophenyl or β-sulfatoethylsulfonylbenzyl, and wherein the sulfo groups are in the 6-position of the naphthalene radicals.

4,798,888

DRY POLYMERS

Kenneth C. Symes, and Peter Flesher, both of West Yorkshire, United Kingdom, assignors to Allied Colloids Ltd., England

Continuation-in-part of Ser. No. 609,681, May 11, 1984, Pat. No. 4,571,422, which is a continuation-in-part of Ser. No. 552,591, Nov. 16, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,671

Claims priority, application United Kingdom, Oct. 19, 1984, 8426529

Int. Cl.[4] C08B 37/00

U.S. Cl. 536—123 **15 Claims**

1. A process of making a powdered microbial polysaccharide comprising spray drying an emulsion in a non-aqueous liquid of an aqueous solution of the said microbial polysaccharide and thereby producing the powdered microbial polysaccharide substantially free of non-aqueous liquid.

8. Spray dried, powdered, microbial polysaccharide having an average particle size below 250 microns and at least 90% by weight of the powder having a particle size range extending over not more than 100 microns.

4,798,889

METHOD FOR STABILIZING UNSATURATED ORGANOSILICONE COMPOSITIONS

Edwin P. Plueddemann, Midland, and Howard M. Bank, Freeland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 13, 1987, Ser. No. 120,256

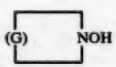
Int. Cl.[4] C07F 7/8

U.S. Cl. 556—401 **58 Claims**

1. A method for stabilizing an organosilicone, selected from alkoxysilanes having a reactive organic group bearing at least one radical selected from the group consisting of acryloxy, methacryloxy, acrylamide, methacrylamide, styryl and vinylbenzyl radicals, said method comprising adding to said organosilicone a stabilizing amount of a hydroxylamine compound selected from the group consisting of those having the general formula

$$Q_2NOH$$

in which Q independently denotes an alkyl radical having 1 to 12 carbon atoms, a cycloalkyl group having 5 to 12 carbon atoms or an aryl group having 6 to 9 carbon atoms, and those having the formula



in which G denotes a hydrocarbyl group having 5 to 11 carbon atoms.

4,798,890

PROCESS FOR PREPARATION OF AZETIDINONE DERIVATIVES

Sigeru Torii; Hideo Tanaka, both of Okayama; Michio Sasaoka, and Takashi Shiroi, both of Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

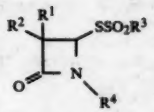
Continuation of Ser. No. 680,722, Dec. 12, 1984, abandoned. This application Apr. 21, 1988, Ser. No. 186,693

Claims priority, application Japan, May 8, 1984, 59-92397

Int. Cl.[4] C07B 45/00; C07D 205.08, 401/06, 403/12

U.S. Cl. 540—358 **6 Claims**

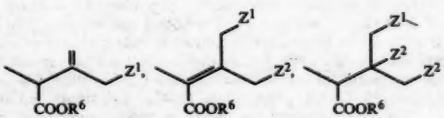
1. A process for preparing an azetidinone derivative represented by the formula



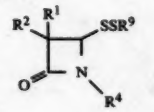
(I)

wherein R^1 is hydrogen, halogen or lower alkoxy, R^2 is hydrogen, a halogen, lower alkoxy, amino or a group

(in which R^5 is substituted or unsubstituted phenyl, substituted or unsubstituted phenylmethyl, substituted or unsubstituted phenoxymethyl, or substituted or unsubstituted benzoyl), or R^1 and R^2, when taken together with the carbon atom in the azetidinone ring, are carbonyl, R^3 is substituted or unsubstituted phenyl, and R^4 is hydrogen or one of the following groups



(in which R^6 is hydrogen or a carboxy protecting group, and Z^1 and Z^2 are the same or different and represent hydrogen, a halogen, C_1–C_4 alkylthio, phenylthio optionally substituted with 1 to 5 nitro groups or halogen atoms on the phenyl ring, 2-pyridylthio, 2-benzothiadiazolylthio, 1,3,4-thiadiazol-5-ylthio, 1,2,3,4-tetrazol-4-ylthio, O-ethyldithiocarbonate, N,N-diethyldithiocarbamate, phenyl-sulfonyl, p-methylphenylsulfonyl, hydroxy, C_1–C_4 alkoxy, C_1–C_4 acyloxy, benzoyloxy, nitrosoxy, diphenylphosphonyloxy, methanesulfonate, diphenylmethyloxy, di(C_1–C_4 alkyl)amino or piperidin-1-yl), the process consisting essentially of reacting a dithioazetidinone derivative represented by the formula



(VI)

wherein R^1, R^2 and R^4 are as defined above and R^9 is a substituted or unsubstituted nitrogen-containing aromatic heterocyclic residue with a compound represented by the formula

$$R^3SO_2H \qquad \text{(VII)}$$

wherein R^3 is as defined above, said reaction being conducted in a reaction system consisting essentially of the dithioazetidinone derivative of formula (VI), the compound of formula (VII), and an organic solvent or a mixture of said organic solvent and water, the organic solvent being at least one selected from the group consisting of ketones, esters, aromatic hydrocarbons, halogenated hydrocarbons, ethers, nitroalkanes, nitriles and alcohols.

4,798,891
VINYLOGOUS PORPHYRINS

Burchard Franck, and Martin Gosmann, both of Muenster, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

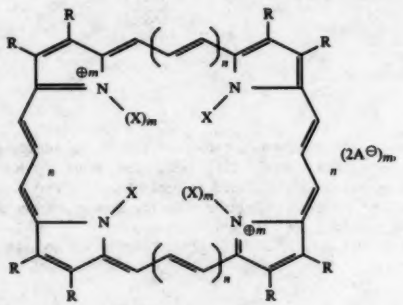
Filed Oct. 15, 1987, Ser. No. 108,706

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635820

Int. Cl.[4] C07D *487/22*

U.S. Cl. 540—472 **3 Claims**

1. A compound of the formula I



(I)

where the symbols n independently of one another are each 1 or 2; or two n's are each 1 and the other two are each 0, m is 0 or 1, A^- is an anion, the radicals X independently of one another are each hydrogen, methyl or ethyl and the radicals R independently of one another are each C_1–C_{20}-alkyl, C_5–C_7-cycloalkyl, C_7–C_{10}-phenylalkyl, C_1–C_6-alkyl substituted by C_1–C_{12}-alkoxycarbonyl, or phenyl or phenyl substituted by chlorine, bromine, cyano, C_1–C_4-alkyl or C_1–C_4-alkoxy, or two adjacent radicals R may furthermore be alkylene or, together with the carbon atoms to which they are bonded, may form an unsaturated or aromatic ring.

4,798,892
2-HYDROXYPROPYLAMINE HETEROARYL ESTER DERIVATIVES

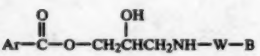
Sheung T. Kam, Chicago; William L. Matier, Libertyville; Ghanshyam Patil, Vernon Hills, and Khuong H. X. Mai, Waukegan, all of Ill., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 320,773, Nov. 12, 1981, Pat. No. 4,582,855. This application Apr. 14, 1986, Ser. No. 851,629

Int. Cl.[4] C07D *307/54, 333/38*

U.S. Cl. 544—146 **9 Claims**

1. A compound of the formula



wherein Ar represents a furyl or thienyl group which may be unsubstituted or substituted with lower alkyl from 1 to about 6 carbon atoms, alkenyl of from 1 to about 6 carbon atoms, alkynyl of from 2 to about 10 carbon atoms, alkoxy wherein the alkyl group contains from 1 to about 6 carbon atoms, halogen, acetamido, amino, nitro, phenoxy, alkylamino of from 1 to about 10 carbon atoms, hydroxy, hydroxyalkyl of from 1 to about 10 carbon atoms, and cyano, arylalkoxy wherein the alkyl group contains from 1 to about 6 carbon atoms and the aryl group represents phenyl which may be unsubstituted or substituted with lower alkyl from 1 to about 6 carbon atoms; W represents alkylene of from 1 to about 10 carbon atoms; and B represents $—NR_2COR_1$, $—NR_2CONR_1R_3$, $—NR_2SO_2R_1$, $—NR_3SO_2NR_1R_3$, oR $—NR_2COOR_1$ wherein R_1, R_2 and R_3 may be the same or different and may be hydrogen, alkyl, alkoxyalkyl, cycloalkyl, alkenyl, alkynyl, phenyl or aralkyl wherein the alkyl group contains from 1 to about 6 carbon atoms and the aryl group represents phenyl which may be unsubstituted or substituted with lower alkyl from 1 to about 6 carbon atoms; furyl or thienyl or R_1 and R_3 may together with N form a morpholino ring and except that R_1 is not hydrogen when B is $—NR_2SO_2R_1$ or NR_2COOR_1; and the pharmaceutically acceptable salts thereof.

4,798,893
PROCESS FOR PRODUCING 1-(5-SUBSTITUTED-2-ETHYNYLPHENYL)-2-PROPANONES

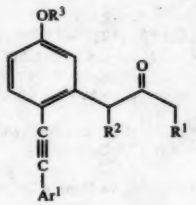
David A. Cherry, Ambler; Cynthia A. Maryanoff, Solebury Township; John E. Mills, Hatfield; Roy A. Olofson, State College, and James D. Rodgers, North Wales, all of Pa., assignors to McNeilab, Inc., Springhouse, Pa.

Filed Sep. 21, 1987, Ser. No. 99,427

Int. Cl.[4] C07D *251/16, 251/20*; C07C *69/78, 49/217*

U.S. Cl. 544—215 **13 Claims**

1. A process for the preparation of a 2-propanone of the following formula (I):



(I)

wherein

R^1 and R^2 are the same and are hydrogen or alkyl;

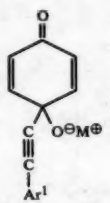
R^3 is hydrogen, alkyl or COR^4;

R^4 is alkyl, substituted alkyl, aryl or substituted aryl; and

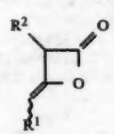
Ar^1 is phenyl or a 5- or 6-membered heterocyclic aromatic ring which rings may be independently substituted by one or more of alkyl, alkoxy, alkylthio, dialkylamino, carboxamido, halogen, fluoroalkyl or cyano,

which comprises the steps of:

(a) condensing a carbinol of the following formula (II) with a diketene derivative of the following formula (III):



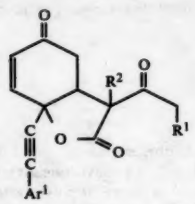
(II)



(III)

wherein

M is a metallic cation, to produce a lactone of the following formula (IV):



(IV)

and

(b) decarboxylating the lactone of formula (IV) in the presence of an R^3 source to produce the 2-propanone of formula (I).

4,798,894

GEM CYCLODIALKYLATION OF AMINES AND AMIDES

Duane C. Hargis, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 11, 1987, Ser. No. 48,585
Int. Cl.[4] C07D *473/34, 295/02*
U.S. Cl. 544—277 **20 Claims**

1. The process of converting an N,N-dialkylatable amino or amido group into an N,N-cyclodialkylated amino or amido group which comprises reacting a compound containing at least one N,N-dialkylatable amino or amido group with (a) an unstrained cyclic ether co-reactive therewith or (b) a polyol cyclizable to an unstrained cyclic ether co-reactive therewith in the presence of a viable titanium dioxide alkylation catalyst characterized by having prior to use a surface area of at least 70 square meters per gram as determined by the BET method and by having prior to use the capability of chemically adsorbing at 100° C. at least 35×10^{-4} millimoles of gaseous ammonia per square meter of surface area, so that at least one such N,N-dialkylatable amino or amido group is transformed into a N,N-cyclodialkylated amino or amido group, respectively.

4,798,895

PROCESS FOR PREPARING LEVOMEPROMAZINE HYDROGEN MALEATE

Christian Berger, Ecully, France, assignor to Rhone-Poulenc Sante, Courbevoie, France

Filed Jun. 24, 1987, Ser. No. 66,010
Claims priority, application France, Jun. 26, 1986, 8609261
Int. Cl.[4] C07D *279/28*
U.S. Cl. 544—41 **3 Claims**

1. A process for preparing levomepromazine hydrogen maleate from (±)-10-(3-dimethylamino-2-methyl-propyl)-2-methoxyphenothiazine, which comprises resolving (±)-10-(3-dimethylamino-2-methylpropyl)-2-methoxyphenothiazine with (−)-di(p-toluoyl)-L-tartaric acid using 0.25 to 0.5 mole of (−)-di(p-toluoyl)-L-tartaric acid per mole of (±)-10-(3-dimethylamino-2-methylpropyl) -2-methoxy-phenothiazine to produce the neutral salt of (−)-di(p-toluoyl) tartaric acid and (±)-10-(3-dimethylamino-2-methylpropyl) -2-methoxyphenothiazine and mother liquors containing (−)-10-(3-dimethylamino-2-methylpropyl)-2-methoxyphenothiazine, and the precipitating levomepromazine hydrogen maleate from the mother liquors by the action of maleic acid, and, optionally, isolating the unresolved racemic base and/or regenerating the (−)-di(p-toluoyl)-L-tartaric acid.

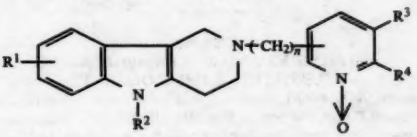
4,798,896

ANTIPSYCHOTIC GAMMA-CARBOLINE N-OXIDES

Magid A. Abou-Gharbia, Wilmington, Del.; John P. Yardley, Gulph Mills, and Cesario O. Tio, Coatesville, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 19, 1988, Ser. No. 145,426
Int. Cl.[4] C07D *471/04*
U.S. Cl. 546—87 **3 Claims**

1. A compound of the formula:



in which

R^1 is hydrogen, halogen, hydroxy, alkoxy of 1 to 6 carbon atoms, or alkyl of 1 to 6 carbon atoms;

R^2 is hydrogen, phenyl or phenyl substituted by a methyl, ethyl, methoxy, ethoxy, halogen, trifluoromethyl, cyano or nitro group;

R^3 and R^4 are hydrogen, or, when taken together, butadienylene; and

n is one of the integers 1, 2, 3, 4, 5, 6 or 7, or a pharmaceutically acceptable salt thereof.

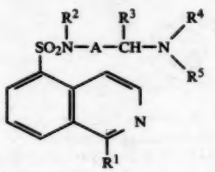
4,798,897

ISOQUINOLINE DERIVATIVES

Hiroyoshi Hidaka, Tshu, and Anri Morikawa, Narashino, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1987, Ser. No. 40,828
Int. Cl.[4] C07D *401/12, 217/00*
U.S. Cl. 546—139 **13 Claims**

1. An isoquinoline derivative represented by the formula (I)



(I)

wherein

R^1 is selected from the group consisting of a hydrogen atom, a chlorine atom and a hydroxyl group;

R^2 is selected from the group consisting of an alkyl group having 1 to 8 carbon atoms and a benzyl group, or directly bonded with R^3 to form Z;

R^3 is selected from the group consisting of a hydrogen atom and an alkyl group having 1 to 8 carbon atoms, or directly bonded with R^2 to form Z;

said Z being selected from the group consisting of an unsubstituted ethylene group, an ethylene group substituted with an alkyl group having 1 to 8 carbon atoms, an unsubstituted trimethylene group, and a trimethylene group substituted with an alkyl group having 1 to 8 carbon atoms;

provided that where R^2 and R^3 are not directly bonded with each other, R^1 is a hydrogen atom, and

where R^2 and R^3 are directly bonded with each other to form Z, R^1 is selected from the group consisting of a hydrogen atom, a chlorine atom and a hydroxyl group;

R^4 and R^5 are independently selected from the group con-

sisting of a hydrogen atom, an alkyl group having 1 to 6 carbon atoms which is unsubstituted or substituted with a phenyl group, and a phenyl group, or R^4 and R^5 are each alkylene groups having 1 to 5 carbon atoms and bonded with each other directly or through an oxygen atom to form a heterocyclic ring in cooperation with the adjacent nitrogen atom, the total number of carbon atoms in the two alkylene groups not exceeding 6; and

A is an alkylene group having 1 to 5 carbon atoms which is unsubstituted or substituted with an alkyl group having 1 to 8 carbon atoms;

or a pharmacologically acceptable acid salt thereof.

4,798,898

ANTITUSSIVE AND MUCUS REGULATING 2-SUBSTITUTED THIAZOLIDINES

Carmelo A. Gandolfi; Silvano Spinelli; Odoardo Tofanetti; Raimondo Russo, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Biochemia Robin S.p.A., Milan, Italy

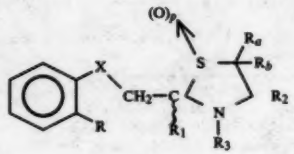
Filed Jul. 17, 1985, Ser. No. 755,834

Claims priority, application United Kingdom, Jul. 27, 1984, 8419254

Int. Cl.[4] A61K *31/425, 31/38;* **C07C** *277/04*

U.S. Cl. 548—146 **15 Claims**

1. Compound of formula I



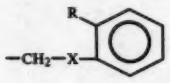
(I)

wherein:

X is a CH_2, O, S;

R is hydroxy, or an ester thereof of formula $R_c—CO_2—$, lower C_1–C_6-alkoxy, $CH_2=CH—CH_2O—$; $HC\equiv C—CH_2—O—$; methyl

R_1 is hydrogen or

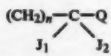


p is zero or 1 with the proviso that when X is sulfur p is zero;

both R_a and R_b are hydrogen or methyl;

R_2 is hydrogen and R_3 is, a C_1–C_2 alkylsulphonyl group, an unsubstituted or mono or polysubstituted phenylsulfonyl group or an acyl group of formula $R_dCO—$;

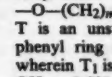
Rc and Rd, which are the same or different are: hydrogen, $—O—C(CH_3)_3$, $—(CH_2)_n—Q$ and



wherein n is 0 or an integer from 1 to 7;

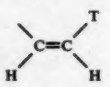
J_1, J_2, are both hydrogen or one of them is hydrogen and the other one is lower C_1–C_4 alkyl or phenyl and Q is selected from the group consisting of:

hydrogen; a C_3–C_4-branched alkyl; a C_3–C_7 cycloalkyl; free or esterified carboxy group; an halogen atom; SH; $—NH_2$; a mono or di-substituted amino, t-butoxy carbonylamino or C_1–C_2 acylamino group; an ether $—O—(CH_2)_m—T$ or thioether $—S—T$ chain, wherein T is an unsubstituted or mono- or polysubstituted phenyl ring or a group of formula $—(CH_2)_m—T_1$, wherein T_1 is selected from the group consisting of H, OH, $—OCH_3$, OC_2H_5, $HOCH_2—CH_2—$, free and esterified carboxy group, NH_2, a C_1–C_2-acylamino or mono- or disubstituted amino group, or a group of formula



wherein R_e is hydrogen, methyl or ethyl and m is an integer from 1 to 3; a phenyl, phenoxy or phenylthio ring unsubstituted or mono- or polysubstituted in the m, o, and p-positions;

a group of formula $—(CH_2)_m—SCO—(CH_2)_nJ$ wherein m and n have the above defined meanings and P_3 is a lower C_1–C_7 linear or branched alkyl chain, a C_3–C_6-cycloalkyl, a disubstituted amino group, a phenyl or phenoxy ring, optionally mono- or polysubstituted in the o, m and p-positions; an alkenyl chain of formula

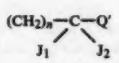


wherein T, in addition to the above defined meanings, is also hydrogen; or

R_2 is a free or esterified carboxy group; and

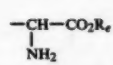
R_3 is hydrogen, a C_1–C_2 alkylsulphonyl group, an unsubstituted or mono or polysubstituted phenylsulfonyl group or an acyl group of formula R'_dCO';

wherein R'd is hydrogen, $—O—C(CH_3)_3$, $—(CH_2)_n—Q'$ and



wherein n is 0 or an integer from 1 to 7; J_1, J_2, are both hydrogen or one of them is hydrogen and the other one is lower C_1–C_4 alkyl or phenyl and Q' is selected from the group consisting of:

hydrogen; a C_3–C_4-branched alkyl; a C_3–C_7 cycloalkyl; free or esterified carboxy group; $—NH_2$; a mono or disubstituted amino, t-butoxy carbonylamino or C_1–C_2 acylamino group; an ether $—O—(CH_2)_m—T$ or thioether $—S—T$ chain, wherein T is an unsubstituted or mono- or polysubstituted phenyl ring or a group of formula $(CH_2)_m—T_1$, wherein T_1 is selected from the group consisting of H, OH, OCH_3, $—OC_2H_5$, $HOCH_2—CH_2—$, free and esterified carboxy group, NH_2, a C_1–C_2-acylamino or mono- or disubstituted amino group, or a group of formula



wherein R_e is hydrogen, methyl or ethyl and m is an integer from 1 to 3; a phenyl, phenoxy or phenylthio ring unsubstituted or mono- or polysubstituted in the m, o, and p-positions;

wherein the term "mono substituted amino group" means an amino group substituted by a C_1–C_6 linear or branched alkyl group or by groups having the formula:

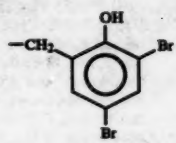
$—CH_2—CH_2—O—CH_2—CH_3$,

$—CH_2—CH_2—O—CH_2—CH_2—OH$,

$—CH_2—CH_2—NH—CH_2—CH_3$,

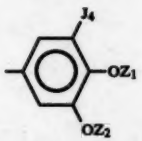
$—CH_2—CH_2—NH—CH_2—CH_2—OH$ or

-continued



wherein the substituents of a disubstituted amino group are linear or branched C_1–C_6 alkyl groups or:

and wherein the term "mono- or polysubstituted phenyl" means phenyl which is substituted by a fluorine atom in the para position, by chlorine atoms in the meta and/or para positions, or by a CF_3 group in the meta position, or a phenyl group of the formula:



wherein Z_1 is H or $COCH_3$ and Z_2 is H, CH_3 or $COCH_3$ and J_4 is hydrogen, aminomethyl, C_1–C_2-acylaminomethyl or a mono or disubstituted aminomethyl group, as above defined; or salts with non-toxic bases or acids thereof, enantiomers, diastereoisomers or mixtures thereof.

4,798,899

COMBATING FUNGI WITH NOVEL AZOLYL-TETRAHYDROFURAN-2-YLIDENE-METHANES

Hans-Ludwig Elbe, Wuppertal; Manfred Jautelat; Karl H. Büchel, both of Burscheid; Wilhelm Brandes, Leichlingen; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

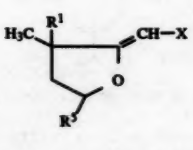
Division of Ser. No. 658,941, Oct. 9, 1984, Pat. No. 4,619,940. This application Jun. 27, 1986, Ser. No. 879,662

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336861

Int. Cl.[4] C07D *249/08, 233/56*

U.S. Cl. 548—262 5 Claims

1. A subetituted 2-methylene-tetrahydrofuran of the formula



in which

X represents chlorine, 1,2,4-triazolyl or imidazolyl, and

R^1, is methyl or ethyl,

R^5 is hydrogen, methyl or bromomethyl with the proviso that R^5 cannot represent hydrogen if R^1 is methyl.

4,798,900

PRODUCING BIS(ALICYCLIC) THIOETHERS

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 10, 1986, Ser. No. 917,773

Int. Cl.[4] C07D *209/48, 307/89;* C07C *51/36*

U.S. Cl. 548—461 12 Claims

1. A process of producing thioethers having two six-membered alicyclic rings in the molecule which comprises heating at a temperature in the range of 100° to 200° C. a reaction system composed of a 3,3'-thiobis(2,5-dihydrothiophene-1, 1-dioxide) and a reactive Diels-Alder dienophile so that cyclization occurs.

4,798,901

NOVEL PYRROLE DERIVATIVES

Jean Tessier, Vincennes; Jean-Pierre Demoute, Montreuil Sous Bois, and Laurent Taliani, Pavillons Sous Bois, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 765,317, Aug. 13, 1985, Pat. No. 4,737,513. This application Dec. 2, 1987, Ser. No. 127,922

Claims priority, application France, Aug. 14, 1984, 84 12791; Apr. 21, 1985, 85 06134

Int. Cl.[4] C07D *207/325, 207/333*

U.S. Cl. 548—562 2 Claims

2. 1-(2-propynyl)-2-trifluoromethyl-3-pyrrol-methanol.

4,798,902

ZIRCONIUM CHELATES AND THEIR USE FOR CROSS-LINKING

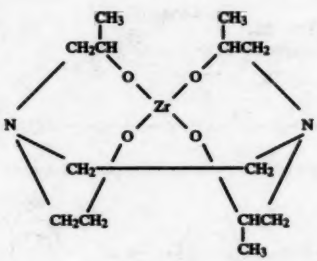
Donald E. Putzig, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 9, 1987, Ser. No. 12,404

Int. Cl.[4] C07F *7/00*

U.S. Cl. 556—54 6 Claims

1. A zirconium diamine chelate represented by the formula:



4,798,903

OPTICALLY ACTIVE 3,3'-DISILYLBINAPHTHOL DERIVATIVES

Hisashi Yamamoto, Aichi, and Keiji Maruoka, Nagoya, both of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

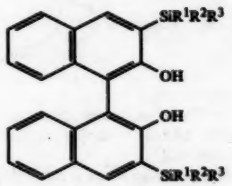
Filed Feb. 25, 1988, Ser. No. 160,258

Claims priority, application Japan, Mar. 10, 1987, 62-54857

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—432 5 Claims

1. Optically active 3,3'-disilylbinaphthol derivatives which are represented by a general formula (I)



(I)

wherein R^1, R^2 and R^3 indicate mutually same or different lower alkyl groups and/or aromatic groups,
and the steric configuration of which is R form or S form.

4,798,904

CERTAIN [(LOWER ALKANOYL-THIO)METHYL-1-OXO-3-PHENYL PROPYL AMINO]BENZENE LOWER ALKANOIC ACID OR ESTER DERIVATIVES WHICH INHIBIT ENKEPHALINASE

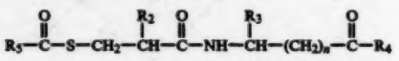
Norma G. Delaney, Princeton; Eric M. Gordon, Pennington, and Miguel A. Ondetti, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 896,318, Aug. 13, 1986, Pat. No. 4,722,810, which is a continuation of Ser. No. 641,221, Aug. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 538,731, Oct. 3, 1983, abandoned. This application Nov. 13, 1987, Ser. No. 119,930

Int. Cl.[4] C07C *153/11*

U.S. Cl. 558—254 17 Claims

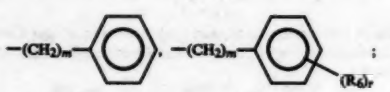
1. A compound of the formula:



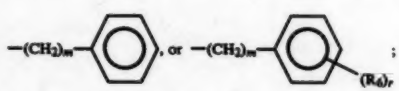
including a pharmaceutically acceptable salt thereof wherein:

R_2 is $-(CH_2)_m$ (R6)r or $-(CH_2)_m$ (R6)r ;

R_3 is hydrogen, lower alkyl,



R_4 is —OH or —OCH_3;
n is an integer from 1 to 15;
R_5 is lower alkyl,



m is zero or an integer from 1 to 4;
R_6 is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, hydroxy, Cl, Br, F or trifluoromethyl; and
r is an integer from 1 to 3 provided that r is more than one only if R_6 is hydroxy, methyl, methoxy, Cl, or F.

4,798,905

SULPHENYLATED CARBAMIC ACID ESTERS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Engelbert Kühle, Bergisch Gladbach; Wilfried Paulus; Hermann Genth, both of Krefeld; Paul Reinecke; Gerd Hänssler, both of Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

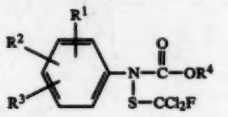
Continuation of Ser. No. 734,924, May 16, 1985, abandoned. This application Aug. 18, 1987, Ser. No. 87,056

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418375

Int. Cl.[4] C07C *145/04*

U.S. Cl. 560—16 5 Claims

1. A N-sulphenylated carbamic acid ester of the formula



in which
R^1 to R^3 are identical or different and denote hydrogen, chloro or methyl and,
R^4 represents methyl.

4,798,906

PREPARATION OF ALKOXY HALIDES

Philip K. G. Hodgson, Walton-on-Thames, and Nevin J. Stewart, Guildford, both of England, assignors to The British Petroleum Company p.l.c., London, England

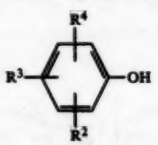
Continuation of Ser. No. 850,568, Apr. 11, 1986, abandoned. This application Jul. 29, 1987, Ser. No. 83,942

Claims priority, application United Kingdom, Apr. 16, 1985, 85-09729

Int. Cl.[4] C07C *41/03, 41/22*

U.S. Cl. 568—614 8 Claims

1. A process for the production of an alkyl-, aryl- or alkylaryl-alkoxy halide which process comprises reacting an alcohol of formula R^1—OH, phenol or an alkyl phenol of formula



wherein R^1 is an alkyl group containing 1 to 24 carbon atoms,
R^2 is an alkyl group containing 1 to 24 carbon atoms and R^3 and R^4 are hydrogen atoms, or
R^2 and R^3 are both alkyl groups containing 1 to 12 carbon atoms and
R^4 is a hydrogen atom, or
R^2, R^3 and R^4 are each alkyl groups wherein the sum of the carbon number of the groups is in the range 3 to 24,
with ethylene oxide and/or propylene oxide to form an alkyl- aryl- or alkylaryl-alkoxy alcohol containing 1 to 15 alkoxy units per molecule,
wherein the alkoxylation reaction is carried out in the presence of a secondary amine as a catalyst and the alkoxyalcohol is directly reacted with a halogenating agent selected from the group consisting of thionyl chloride and sulphuryl chloride in the continuing presence of the amine catalyst.

4,798,907

CONTROLLED TEMPERATURE PROCESS FOR MAKING 2,2'-OXODISUCCINATES USEFUL AS LAUNDRY DETERGENT BUILDERS

Clifford L. MacBrair, Jr.; Daniel S. Connor; Herbert C. Kretschmar, all of Cincinnati, and James A. Cleary, Hamilton, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 26, 1988, Ser. No. 160,615
Int. Cl.[4] C07C 59/235
U.S. Cl. 562—583 27 Claims

1. In an aqueous process for manufacturing 2,2'-oxodisuccinate by reacting starting-materials comprising the components:

I. an organic starting-material component comprising maleate;

II. a divalent metal cation component; and

III. an alkali component, to achieve the partial conversion of the organic starting-material component to 2,2'-oxodisuccinate, said process tending to form a fumarate byproduct, the improvement whereby a 2,2'-oxodisuccinate yield of about 80% or higher is secured, said improvement comprising:

A. selecting starting-materials which comprise:

I. an organic comprising maleate and preformed malate at a maleate:malate mole ratio in the range from about 0.7:1 to about 2.0:1;

II. a divalent metal cation component selected from calcium, magnesium and mixtures thereof at a divalent cation component:organic component mole ratio in the range from about 0.1:1 to about 0.95:1;

III. an alkali component selected from hydroxide and hydroxide-forming anions; and, additionally,

IV. a solubilizing monovalent cation component selected from sodium, potassium and mixtures thereof; and

B. conducting the process in a fluid, aqueous alkaline mixture of said starting-materials having the following net concentrations by weight:

water:

no more than about 75%;

alkali component III, expressed as net excess hydroxide:

at least about 0.0001%; and

solubilizing monovalent cation component IV:

at least about 1%; and

reacting said mixture B for a period sufficient to attain said 2,2'-oxodisuccinate yield at temperatures in the range from about 20° C. to about 110° C., and

arresting the reaction;

provided that the total duration of reaction is not less than about 12 hours an not more than about 400 days and further provided that:

the total time at any temperature above about 100° C. does not exceed about 1.5 hours and

the total time at any temperature above about 90° C. does not exceed about 4.5 hours and

the total time at any temperature above about 80° C. does not exceed about 13.5 hours and

the total time at any temperature above about 70° C. does not exceed about 1.7 days and

the total time at any temperature above about 60° C. does not exceed about 5.1 days and

the total time at any temperature above about 50° C. does not exceed about 15 days and

the total time at any temperature above about 40° C. does not exceed about 46 days and

the total time at any temperature above about 30° C. does not exceed about 137 days.

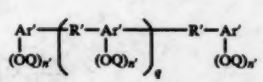
4,798,908

CURABLE AMIDOALKYLAROMATIC COMPOSITIONS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 723,971, Apr. 16, 1985, Pat. No. 4,632,965, and a continuation-in-part of Ser. No. 301,170, Sep. 11, 1981, Pat. No. 4,517,131. This application Aug. 29, 1986, Ser. No. 901,842
Int. Cl.[4] C07C 103/00
U.S. Cl. 564—153 5 Claims

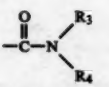
1. A composition comprising a compound represented by the formula:



(A)

wherein each Ar' independently is mono-or polyvalent organic radical selected from moieties having from 1 to about 2 aromatic rings, n, is individually selected from 0, 1 or 2, with the proviso that at least one n, is not zero, q is at least 0.001; R' is independently a divalent hydrocarbon moiety having from 1 to about 3, carbon atoms or a

group, wherein z has a value of from zero to about 10 and Q is independently H or $(CR_1R_2)Y$ with the proviso that not all Q moieties are H; and Y is



wherein R_3 and R_4 are independently H or C_1–C_{10} alkyl; and wherein R_1 and R_2 are independently H or C_1–C_{10} alkyl.

4,798,909

PROCESS FOR RECOVERY OF POLYARYLPOLYAMINES

Efim Biller, Dufourstrasse 42, Zurich, Switzerland

Continuation of Ser. No. 95,023, Nov. 16, 1979, abandoned, which is a division of Ser. No. 914,814, Jun. 12, 1968, Pat. No. 4,250,114, which is a continuation of Ser. No. 792,951, May 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 690,341, May 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 474,302, May 30, 1974, abandoned. This application Nov. 23, 1983, Ser. No. 555,422
Claims priority, application Austria, Jun. 1, 1973, 4826/73; Sep. 17, 1973, 7991/73; Apr. 29, 1974, 3508/74; Switzerland, Nov. 11, 1975, 14618/75; May 5, 1976, 5854/76; Aug. 4, 1976, 10049/76; Nov. 6, 1976, 14011/76
Int. Cl.[4] C07C 87/50
U.S. Cl. 564—334 6 Claims

1. In a process for the preparation of polyamines wherein an aryl amine is reacted with formaldehyde in the presence of an acid catalyst to form said polyamine, sufficient water is employed to cause separation of the reactant mixture during extraction of said mixture with the aryl amine into an organic phase and an aqueous phase and subsequently returning the aqueous phase to the reactor and recovering the resultant polyamine from the organic phase by known means, the improvement which comprises conducting the extraction at about room temperature and conducting the extraction in the

presence of a water soluble inorganic salt which is non-reactive with any of the components of the process.

4,798,910

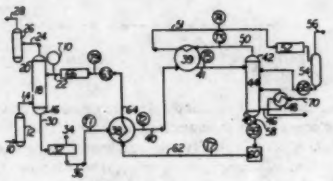
PROCESS SEQUENCING FOR AMINE REGENERATION

J. Pearman Herrin, 2703 Oak Bluff, San Antonio, Tex. 78230

Continuation-in-part of Ser. No. 696,253, Jan. 29, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 921,630

Int. Cl.[4] C07C *85/26*

U.S. Cl. 564—497 **3 Claims**



1. A conventional amine regenaration process having at least a contactor, a first heat exchanger immediately downstream of said contactor, a stripper still, an overhead gas condenser, a lean amine cooler and a still reboiler comprising the additional steps of:

a first passing of rich amine liquid from the bottom of said contactor through said first heat exchanger said first exchanger not dispositioned on top of said stripper still;

transferring at least a portion of hot overhead gasses exiting the top of said stripper still to a second exchanger said second heat exchanger not dispositioned on top of said stripper still;

controlling by a temperature control means the temperature of a heated rich amine liquid into said second heat exchanger;

a second passing of said temperature controlled heated rich amine liquid through said second exchanger wherein said hot overhead gasses transfer thermal energy to said temperature controlled heated rich amine liquid resulting in a higher temperature rich amine and reduced temperature overhead gasses;

transferring said reduced temperature overhead gasses to said overhead gas condenser for separation into acid gasses and water;

a first transferring hottest lean amine from the bottom of said stripper still to a third heat exchanger;

a third passing of said higher temperature rich amine liquid through said third heat exchanger wherein said hottest lean amine from said bottom of said stripper still transfers thermal energy to said higher temperature rich amine liquid resulting in a highest temperature rich amine and hot temperature lean amine;

transferring said highest temperature rich amine liquid into said top of said stripper still for contacting steam generated within said still;

a second transferring said hot temperature lean amine to said first heat exchanger wherein said hot temperature lean amine transfers thermal energy to said rich amine liquid resulting in said heated rich amine liquid and a lower temperature lean amine;

a third transferring said lower temperature lean amine to said lean amine cooler;

said steps of first, second, and third transferring occurring in successive sequential order; and

said steps of first, second, and third passing occurring in successive sequential order, whereby a reduction in the heat requirement is obtained at said still reboiler.

4,798,911

CATALYST COMPOSITION AND METHOD FOR SELECTIVE DEHYDROGENATION

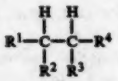
Carl M. Lentz, Mt. Carmel; Bruce L. Gustafson, and Paul S. Wehner, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,375

Int. Cl.[4] C07C *37/06, 39/12, 5/333, 5/367*

U.S. Cl. 568—747 **23 Claims**

1. A method for the selective dehydrogenation of a compound to produce an aromatic compounds or an acyclic olefin, said method, comprising dehydrogenating a compound of the formula



wherein each of R^1, R^2, R^3 and R^4 is independently selected from the group consisting of H, (C_1–C_{20}) alkyl, (C_3–C_{20}) cycloalkyl, (C_6–C_{20}) aryl, (C_7–C_{20}) alkylaryl, and (C_7–C_{20}) aralkyl groups, and substituted (C_1–C_{20}) alkyl, (C_3–C_{20}) cycloalkyl and (C_6–C_{20}) aryl, (C_7–C_{20}) alkylaryl and (C_7–C_{20}) aralkyl; each such group optionally substituted with —OR, wherein R is R^1, R^2, R^3 or R^4; and wherein R^1 and R^2 or R^3 and R^4 may be joined as part of a ring structure, at a dehydrogenation temperature in the presence of a catalyst comprising about 0.01 wt %–19.9 wt % Pd, and about 0.01 wt %–19.9 wt % Cu on a carbon support, wherein the total amount of (Pd+Cu) on the support is about 0.02 wt % to 20 wt %, the weight ratio of Pd:Cu is about 1:1 to 10:1, and the carbon support has a surface area of at least about 100 m^2/g and is essentially free of reactive sulfur.

4,798,912

SUBSTITUTED PHENOXYBENZYL-(DIHALODIMETHYLCYCLOPROPYL-METHYL)ETHERS

Laurenz Gsell, Basel, and Peter Ackermann, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

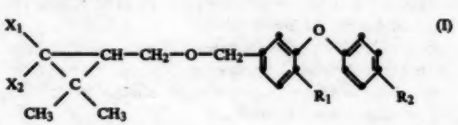
Filed Nov. 9, 1987, Ser. No. 118,816

Claims priority, application Switzerland, Nov. 19, 1986, 4619/86; Oct. 1, 1987, 3822/87

Int. Cl.[4] C07C *43/225*

U.S. Cl. 568—637 **13 Claims**

1. A compound of the formula I



(I)

in which

X_1 and X_2 each independently of the other represents fluorine, chlorine or bromine;

R_1 represents hydrogen or fluorine; and

R_2 represents hydrogen, fluorine, chlorine, bromine, methyl, trifluoromethyl or methoxy, and, if X_1 and X_2 have different meanings, the optical isomers of the compound of the formula I.

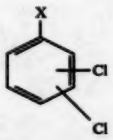
4,798,913

METHOD FOR SEPARATING A TRIHALOGENOBENZENE ISOMER

Kikuo Otomo; Masashi Yamaguchi; Masami Ito, and Hiroki Tokunaga, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1988, Ser. No. 140,991
Int. Cl.[4] C07C *17/38, 25/10*
U.S. Cl. 570—211 10 Claims

1. A method for separating a trihalogenobenzene isomer from a mixture of at least two trihalogenobenzene isomers selected from the group consisting of 1,2,3-, 1,2,4- and 1,3,5-substituted isomers among trihalogenobenzenes represented by the formula:



wherein X is Cl or Br, by means of a zeolite adsorber, characterized in that a ZSM-zeolite is used as the adsorber.

4,798,914

PROCESS FOR THE PRODUCTION OF VINYL CHLORIDE THROUGH THERMAL CRACKING OF 1,2-DICHLOROETHANE

Gerhard Link, Mainz; Walter Fröhlich; Reinhard Krumböck, both of Burgkirchen; Georg Prantl, and Iwo Schaffelhofer, both of Burghausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 8, 1987, Ser. No. 106,721
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1986, 3634550; Feb. 10, 1987, 3704028
Int. Cl.[4] C07C *17/34, 21/06*
U.S. Cl. 570—226 10 Claims

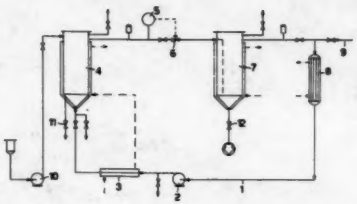
1. A process for the production of vinyl chloride through thermal elimination of hydrogen chloride from 1,2-dichloroethane in a cracking furnace, liquid 1,2-dichloroethane being warmed indirectly and evaporated using the hot, vinyl chloride-containing gas leaving the cracking furnace, and the gaseous 1,2-dichloroethane being introduced to the cracking furnace, which comprises warming the 1,2-dichloroethane to boiling in a first container with the vinyl chloride-containing gas and transferring said 1,2-dichloroethane from here into a second container in which it is partially evaporated, without further warming, under a lower pressure than in the first container, the evaporated 1,2-dichloroethane being fed into the cracking furnace and the nonevaporated 1,2-dichloroethane being fed back to the first container.

4,798,915

PROCESS FOR THE EXTRACTION OF PARAFFINS FROM MIXTURES THEREOF WITH ALKANE-SULFONIC ACIDS

Lucio Faggian; Armando Marcotullio; Edoardo Platone, all of San Donato Milanese, and Emilio Picchi, Milan, all of Italy, assignors to Enitricerche S.p.A., Milan and Enichem Augusta S.p.A., Palermo, both of, Italy

Filed Mar. 18, 1987, Ser. No. 27,548
Claims priority, application Italy, Mar. 27, 1986, 19893 A/86
Int. Cl.[4] C07C *143/24*
U.S. Cl. 585—833 4 Claims



1. A process for extracting paraffins from a mixture of alkane-sulfonic acids, paraffins and sulfuric acid, said mixture being the product of the sulfoxidation of paraffins having from 12 to 18 carbon atoms, comprising adding one or more alcohols to said mixture, and contacting the mixture-alcohol combination with carbon dioxide under supercritical conditions of at least 32° C. and at least carbon dioxide critical pressure of 73.8 bars.

ELECTRICAL

4,798,916

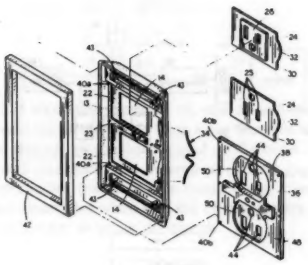
SAFETY PLATE FOR ELECTRICAL OUTLET

Stephen M. Engel, 512 N. Highland, and Wallace W. Weiger, 1005 W. 2nd, both of Pierre, S. Dak. 57501

Continuation-in-part of Ser. No. 91,722, Aug. 28, 1987, abandoned. This application Oct. 19, 1987, Ser. No. 109,758

Int. Cl.[4] H01R *13/453*

U.S. Cl. 174—67 **8 Claims**



1. A safety plate for a conventional electrical outlet of the type having a pair of receptacles, each receptacle having apertures therein for receiving the prongs of an electrical plug, comprising:

a cover plate having a pair of vertically aligned openings therethrough, the openings located so as to be centered over the receptacles of an outlet when the cover plate is fastened thereto;

said cover plate having a front surface, rearward surface, and a rearwardly projecting lip extending around the perimeter thereof;

the rearward surface of said cover plate having a pair of depressions therein for receiving slidable panels and a biasing means, the depressions surrounding the openings in said cover plate;

a pair of panels slidably mounted in the depressions in said cover plate;

said panels having a raised portion projecting forwardly through said cover plate openings so as to be flush with the front surface of said cover plate, said raised portion having dimensions to allow only horizontal slidable movement of the panel in said cover plate;

said panels further having apertures therein corresponding to the apertures in said receptacles, and in alignment therewith when said panels are in a use position;

biasing means connected to the rearward side of said cover plate adapted to bias said panels from their use position where the panel apertures are aligned with the receptacle apertures, to a non-use position where the panel apertures are misaligned from the receptacle apertures;

a back plate having apertures therethrough corresponding with said receptacle apertures and in alignment therewith when the cover plate is attached to the outlet, said back plate fastened to the rearward surface of said cover plate, and enclosing said slidable panels and biasing means within said depressions in the cover plate; and

means for removably attaching said cover plate to a conventional outlet.

4,798,917

KIT FOR PRODUCING FIREPROOF CABLE DUCTS

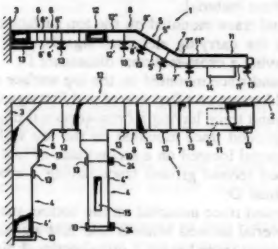
Horst W. Eiermann, Basel, Switzerland, and Christian Mühl, Nördl. Münchner Strasse 15B, D-8022 Grünwald, Fed. Rep. of Germany, assignors to PCT Pyrochemtek AG, Switzerland; Chemische Fabrik Grunau GmbH and Christian Mühl, both of, Fed. Rep. of Germany

Filed Oct. 31, 1986, Ser. No. 926,364

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538844

Int. Cl.[4] H02G *3/04*

U.S. Cl. 174—72 R **23 Claims**



1. A kit for producing a fireproof cable duct (1) from a plurality of parts, comprising:

a plurality of endwise connectable, self-supporting duct sections (4 to 12) made from thermally insulating material with substantially elongated reinforcements, the duct sections being prefabricated, and self-supporting when attached together, the duct sections (4 to 12) in each case having a trough section (4' to 12') made from thermally insulating material, the reinforcements externally reinforcing the trough sections and comprising longitudinally continuous sheet metal parts (16), the trough sections having a substantially U-shaped cross-section, and covers (4'' to 12'') fittable on the trough sections, the covers being made from thermally insulating material, the trough sections (4' to 12') being assemblable without the covers for cover-less laying of the duct (1) by connection of adjacent trough sections (4' to 12'), and the covers (4'' to 12'') being detachably fixable to the trough sections, some of the duct sections being of different cross-sectional widths, and certain of the duct sections having widening and narrowing cross-sections for attachment thereto.

23. A kit for producing fireproof cable ducts for cables and lines, comprising:

a plurality of prefabricated, self-supporting duct sections having trough sections made from thermally insulating material and longitudinally continuous sheet metal parts externally reinforcing the trough sections, the trough sections having a substantially U-shaped cross-section, the trough sections being endwise connectable and self-supporting when connected;

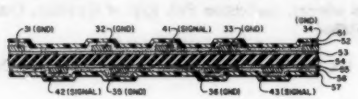
covers fittable on the trough sections, the covers also being made from thermally insulating material, the trough sections being self-supporting when connected apart from said covers; and

a plurality of cross-arms for supporting the trough sections in a vicinity of points of connection between end connecting faces of successive trough sections, the end connecting faces of the trough sections being perpendicular to adjacent bottom surfaces of the trough sections.

4,798,918
HIGH DENSITY FLEXIBLE CIRCUIT

Ashok N. Kabadi, Beaverton; Leonard O. Turner, and Michael T. White, both of Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 21, 1987, Ser. No. 99,259
Int. Cl.[4] H01B 7/08
U.S. Cl. 174—36 15 Claims

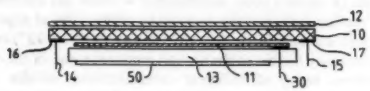


1. A circuit for coupling devices, comprising:
a strip of base material;
a first signal trace mounted on the top surface of said base material for carrying electrical signals, said first signal trace having a cross-sectional dimension D;
a first ground trace mounted on the top surface of said base material located on a first side of said first signal trace, said first ground trace having a cross-sectional dimension D;
a second ground trace mounted on the top surface of said base material located on a second side of said first signal trace, said second ground trace having a cross-sectional dimensional D;
a third ground trace mounted on the bottom surface of said base material located beneath said first signal trace, said third ground trace having a cross-sectional dimension D;
a fourth ground trace mounted on the bottom surface of said base material located adjacent to said third ground trace, said fourth ground trace having a cross-sectional dimension D.

4,798,919
GRAPHICS INPUT TABLET WITH THREE-DIMENSIONAL DATA

Milan Miessler, Romsey, and Rafael Pascual, Winchester, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1988, Ser. No. 166,957
Claims priority, application United Kingdom, Apr. 28, 1987, 8710033
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—18 10 Claims

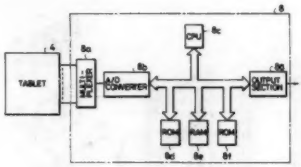


1. A graphics input tablet comprising a layer of electrically resistive material (10) supported co-extensively with a layer of electrically conductive material (11) to provide a flat tablet surface, the resistive material having the property that the electrical resistance between the layers in the region of localized pressure applied thereto changes monotonically with the applied pressure, first and second conductors (14,15) connected respectively to first and second portions of the resistive layer (18,19), said portions being spaced apart on a first notional line across the tablet surface, the construction and arrangement being such that with an electrical potential applied between the resistive layer and the conductive layer substantially no current flows through said first and second conductors, but with said localized pressure applied to said tablet surface currents flow through said first and second conductors, the relative magnitudes of the currents being related to the respective distances of the region of applied pressure from the first and second portions and the total current flowing between the resistive sheet and the conductive sheet being related to the magnitude of the applied pressure.

4,798,920
STYLUS COORDINATE DETERMINING DEVICE WITH DISTORTION COMPENSATION

Toshiyuki Makino, and Tsuyoshi Yamaguchi, both of Kanagawa, Japan, assignors to Hitachi Seiko, Ltd., Kanagawa, Japan

Continuation of Ser. No. 773,199, Sep. 6, 1985, abandoned. This application Mar. 9, 1987, Ser. No. 23,926
Int. Cl.[4] G01B 7/14; G01N 27/72; G01R 33/00; G08C 21/00
U.S. Cl. 178—19 2 Claims



1. A stylus coordinate determining device comprising:
a tablet having a periodic pattern of conductors arranged thereon;
an exciting device adapted to be moved across a surface of said table and to be electromagnetically coupled to said conductors;
generator means for exciting said exciting device with a periodic waveform to generate a periodic output signal as said exciting device is moved on said surface of said tablet, said periodic output signal including a periodic distortion component having a magnitude dependent on the positional relationship on the tablet surface between the exciting device and the periodic pattern of conductors;
means for digitizing said periodic output signal to produce a periodic digital signal;
memory means for storing a periodic distortion compensation signal corresponding to said distortion component for each period of said periodic signal; and
arithmetic means for arithmetically combining said periodic digital signal and said periodic distortion compensation signal to produce a compensated output signal free from said periodic distortion component caused by the positional relationship on the tablet surface between said exciting device and said periodic pattern of conductors.

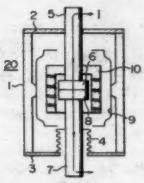
4,798,921
VACUUM CIRCUIT BREAKER

Hideo Watanabe, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,711
Claims priority, application Japan, Jun. 5, 1987, 62-139783
Int. Cl.[4] H01H 33/66
U.S. Cl. 200—144 B 5 Claims

1. A vacuum circuit breaker comprising a vacuum vessel, a

pair of arc electrodes disposed opposite to each other in said vacuum vessel, a pair of rods supporting said arc electrodes thereon respectively and extending to the outside of said vacuum vessel, and means for moving one of said rods relative to the other rod to move one of said arc electrodes toward and away from the other arc electrode thereby closing and breaking a circuit, said vacuum circuit breaker further comprising a



cup-shaped coil electrode mounted on one of said rods and surrounding said arc electrodes to form a gap between said coil electrode and said arc electrode mounted on the other rod not having any coil electrode, the dimension of said gap being selected to be smaller than that of a contact gap formed between said arc electrodes when said arc electrodes are moved away from each other to break the circuit.

4,798,922

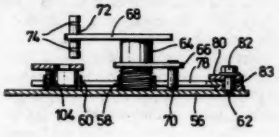
SPRING ACTUATED LATCH, LOAD AND TRIP MECHANISM FOR SWITCHGEAR

Gerald B. Roberts, Paris, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Oct. 6, 1987, Ser. No. 106,546

Int. Cl.[4] H01H *1/42, 3/00, 5/10*; F16C *33/10*

U.S. Cl. 200—400 **16 Claims**



16. In electrical switchgear having a pair of mated, electrically conductive switch contacts adapted for selective engagement to complete an electrical circuit through the switchgear, one of said contacts being stationary, the other of said contacts being shiftable with respect to the one contact and being mounted upon a switchblade, said switchblade being supported on an elongated shaft for pivotal movement thereof in order to selectively engage and disengage said contacts, the improvement of low cost bearing structure for said switchblade shaft, said improved bearing structure comprising:

screw threading on one end of said shaft; and

a mounting element for threadably receiving the threaded end of said shaft, said mounting element being cooperatively threaded,

said shaft end and mounting element being cooperatively configured for permitting relative rotation therebetween and limited axial movement during pivotal movement of said switchblade, whereby said switchblade is pivotally supported by virtue of the threaded interconnection between said shaft end and mounting element.

4,798,923

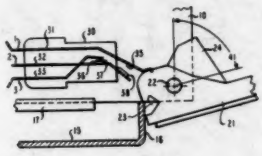
LATCH/SWITCH FOR SECURING A CIRCUIT MODULES INTO A HOUSING WITH ACCOMPANYING CIRCUIT SWITCHING

Morris L. Barwick, Denville, and Ronald B. Praught, Freehold, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 22, 1987, Ser. No. 112,319

Int. Cl.[4] H01H *9/20*

U.S. Cl. 200—50 R **11 Claims**



1. A circuit module including a latch/switch arrangement for inserting and securing the circuit module into an apparatus housing, comprising:

a latch pivotably mounted on the circuit module for inserting and securing the circuit module into the apparatus housing,

a switching arrangement mounted on the circuit module including first, second, and third conductive leaf springs;

the latch including a cam surface to engage and apply pressure to displace the first conductive leaf spring from a rest position, when the latch is rotated to secure the circuit module into the housing,

the second and third conductive leaf springs being situated to be conductively connected in an absence of displacement of the second conductive leaf spring,

the cam surface initially flexing the first conductive leaf spring as the latch is rotated causing the first and second conductive leaf springs to be conductively joined,

further rotation of the latch causing the cam surface to displace the first conductive leaf spring sufficiently to flex the second leaf spring causing it to disengage from the third conductive leaf spring.

4,798,924

COMPRESSED-GAS BREAKER

Ulrich Ackermann, Turgi, Switzerland, assignor to BBC Brown Boveri & Co., Ltd., Switzerland

Filed May 12, 1988, Ser. No. 194,019

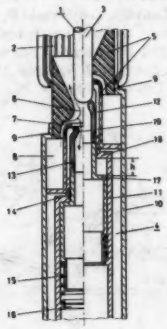
Claims priority, application Switzerland, May 13, 1987, 1840/87

Int. Cl.[4] H01H *33/70*

U.S. Cl. 200—148 R **3 Claims**

1. Compressed-gas breaker having two contact members (3; 11, 12, 13) which can be brought into or out of engagement with one another along one axis, of which a first one (11, 12, 13) is constructed as a nozzle and exhibits contact fingers (12) elastically mounted on a tubular contact carrier (11), having an insulating nozzle (5) and having a heating volume (8) for storing switching-arc-generated compressed gas, in which, in the operated condition, a second one (3) of the two contact members (3; 11, 12, 13) is conducted through the constriction (6) of the insulating nozzle (5) and is inserted, with a free end, into the first contact member (11, 12, 13) whilst forming a contact force with the contact fingers (12), and in which, during interruption, compressed gas flows from the heating volume (8) through the insulating nozzle (5) and the first contact member (11, 12, 13) into an exhaust space, wherein the first contact member (11, 12, 13) exhibits a tubular body (13), which is axially displaceably conducted in the contact carrier (11), of

erosion-resistant contact material, and which forms, during interruption, the nozzle constriction (19) of the first contact



member (11, 12, 13) whilst under the action of a driving mechanism.

4,798,925

METHOD FOR MEASURING EFFECTIVE HEATING POWER FOR HIGH FREQUENCY HEATING

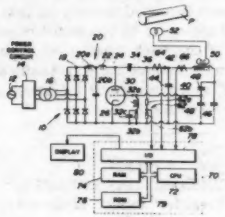
Yuji Ishizaka, Kanagawa, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,400

Claims priority, application Japan, Jul. 4, 1986, 61-156229; Oct. 20, 1986, 61-247602

Int. Cl.[4] H05B 6/06

U.S. Cl. 219—10.41 **9 Claims**



1. A method of controlling high frequency heating apparatus having a source of high frequency AC power connected through a conductor to a resonant circuit having a supply of high frequency AC power from the source for applying a high frequency AC power to a workpiece, comprising the steps of:

sensing a first current flowing through the conductor;

sensing a voltage appearing on the conductor;

sensing a sound current at a position in the resonant circuit;

sampling the sensed first current at predetermined time intervals to provide information on the waveform of the sensed first current;

sampling the sensed voltage at predetermined time intervals to provide information on the waveform of the sensed voltage;

sampling the sensed second current at predetermined time intervals to provide information on the waveform of the sensed second current;

calculating an effective value P_{HF} for the power supplied through the conductor to the resonance circuit from the sampled values of the sensed first current and the sampled values of the sensed voltage;

calculating an effective value I_f for the sensed second current from the sampled values of the sensed second current;

calculating a power loss W produced in components following the source as a function of the calculated effective value I_f;

calculating a value Pw as a $Pw=P_{HF}-W$; and

outputting the calculated value Pw as a measured value for an effective heating power applied to the workpiece at a position to be heated.

4,798,926

METHOD OF HEATING SEMICONDUCTOR AND SUSCEPTOR USED THEREFOR

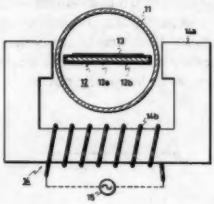
Takamasa Sakai, Kusatsu, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 6, 1987, Ser. No. 22,885

Claims priority, application Japan, Mar. 6, 1986, 61-047282

Int. Cl.[4] H05B 6/10

U.S. Cl. 219—10.43 **6 Claims**



1. A heating apparatus for use in heating a plurality of semiconductor wafers for epitaxial growth processing, comprising:

a ferromagnetic susceptor for receiving a plurality of semiconductor wafers thereon;

a first quartz pipe within which said ferromagnetic susceptor is adapted to be located, said pipe being operable to enable said wafers to be removably positioned on said susceptor;

a semiconductor treatment atmosphere maintained within said first quartz pipe for isolating said ferromagnetic susceptor and said semiconductor wafers from an external atmosphere, said ferromagnetic susceptor inert to said treatment atmosphere;

a second quartz pipe disposed within said first quartz pipe;

a rotor within said second quartz pipe, said rotor having a periphery carrying a plurality of alternating magnetic poles for generating a magnetic flux; and

an electromotive source for rotating said rotor;

said susceptor encircling said second quartz pipe

whereby rotation of said rotor by said electromotive means through said magnetic flux induces corresponding eddy currents in said ferromagnetic susceptor, said eddy currents generating heat in said ferromagnetic susceptor, thereby heating said semiconductor wafers disposed thereon.

4,798,927

COMBINED MICROWAVE AND ELECTRIC OVEN WITH INTERMITTENT POWER SUPPLY TO BOTH MICROWAVE AND ELECTRIC HEATING ELEMENTS

Ikuyasu Kaminaka, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 25, 1987, Ser. No. 18,464

Claims priority, application Japan, Feb. 28, 1986, 61-45001

Int. Cl.[4] H05B 6/68

U.S. Cl. 219—10.55 B **3 Claims**

1. A microwave oven, comprising:

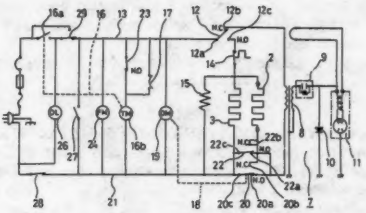
a heating chamber in which food is heated;

microwave heating means for supplying high frequency energy to the heating chamber;

a first thermal heater provided in an upper area of the heating chamber;

a second thermal heated provided in a lower area of the heating chamber;

selector switch means for selectively applying power to said microwave heating means or said first and second thermal heaters;



means for intermittently cutting off power to said microwave heating means when selected by said selector switch means, and for intermittently cutting off power to said first thermal heater when selected by said selector switch means; and

means for selectively bypassing said intermittent cutting-off means to permit continuous power to be supplied to said microwave heating means or said first thermal heater when selected by said selector switch means.

4,798,928

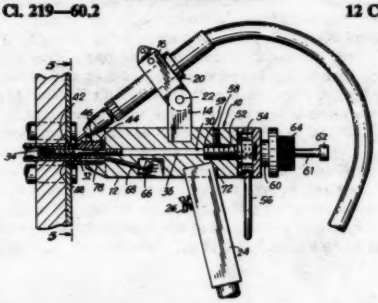
APPARATUS FOR TACK WELDING A TUBE TO A TUBESHEET

Lucas H. VanRhyn, Dansville, N.Y., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Mar. 26, 1987, Ser. No. 30,306

Int. Cl.[4] B23K 9/12

U.S. Cl. 219—60.2 **12 Claims**



1. An apparatus for tack welding a tube to a tubesheet comprising:

a main frame;

a welding torch attached to the main frame;

a tube stop fixed with respect to the main frame and having a surface for abutting an end of a tube projecting through and beyond a tubesheet;

a tube projection gauge fixed with respect to the main frame and projecting a predetermined distance in a direction beyond the tube stop, the tube projection gauge having a surface for abutting the tubesheet;

a tube pilot attached to the main frame and projecting in said direction beyond the tube projection gauge, the tube pilot being adapted for insertion into and fixation within the tube; and

means to fix the tube pilot within the tube;

whereby the apparatus can be positioned so that the tube pilot is within the tube with the end of the tube abutting the tube stop, the tube pilot can be fixed within the tube to hold the tube in such position with respect to the apparatus, and the apparatus moved in said direction until the tube projection gauge contacts the tubesheet to properly position the tube with respect to the tubesheet for a tack weld upon actuation of the torch.

4,798,929

WIRE ELECTRIC DISCHARGE MACHINING APPARATUS

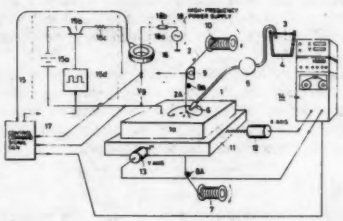
Tetsuroh Itoh, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1987, Ser. No. 57,201

Claims priority, application Japan, Jun. 3, 1986, 61-128722; Jun. 3, 1986, 61-128723; Jun. 3, 1986, 61-128724; Jun. 3, 1986, 61-128725; Jun. 3, 1986, 61-128726; Jun. 3, 1986, 61-128727; Jun. 3, 1986, 61-128728; Jun. 3, 1986, 61-128729; Jun. 3, 1986, 61-128730; Jun. 3, 1986, 61-128731; Jun. 3, 1986, 61-128732; Jun. 3, 1986, 61-128733; Jun. 3, 1986, 61-128734; Jun. 3, 1986, 61-128735; Jun. 3, 1986, 61-128736

Int. Cl.[4] B23H 7/02, 1/02, 1/10, 7/14

U.S. Cl. 219—69 W **20 Claims**



1. An electric discharge machining apparatus comprising:

a wire-shaped electrode disposed in confronting relation to a workpiece with an insulative machining liquid provided therebetween;

means for applying a DC pulse voltage between said electrode and said workpiece to produce an electric discharge therebetween;

means for superposing a high-frequency AC voltage, different from said DC pulse voltage, in a quiescent time of the DC pulse voltage applied between said electrode and said workpiece;

detecting means for detecting the degree of insulation of said insulative machining liquid which is present between said electrode and said workpiece in accordance with said high-frequency AC voltage;

comparing means for comparing the degree of insulation as detected by said detecting means in a gap between said electrode and said workpiece with a predetermined reference value and providing an output signal accordingly;

gap condition determining means for determining the condition of the gap and issuing at least one output signal indicative of the gap condition based on the output signal form said comparing means; and

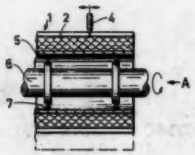
control means for modifying the gap condition between said electrode and said workpiece based on said at least one output signal from said gap condition determining means.

4,798,930

PROCESS FOR PRODUCING A WELD-BUILT MEMBER

Max Geisseler, Ettenhausen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 6, 1987, Ser. No. 35,095
Claims priority, application Switzerland, Apr. 9, 1986, 1403/86
Int. Cl.[4] B23K 9/04
U.S. Cl. 219—76.12 9 Claims



1. A process for producing a weld-built member comprising the steps of

establishing an electric arc between a parent member and at least one electrode;

melting build-up material in said arc under a set of welding parameters;

moving the parent member and the electrode relative to each other while depositing the melted material on the parent member;

varying at least one welding parameter in at least one predetermined zone of relative movement between the electrode and parent member to interrupt depositing of the material and form an open channel therein;

placing a former in the formed open channel to define a closed channel of predetermined cross-sectional shape; and

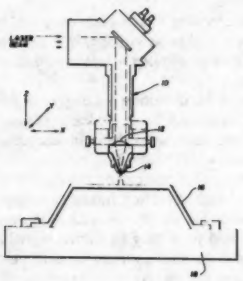
thereafter resuming the relative movement of the parent member and the electrode while depositing melted material under said set of welding parameters to close over the former and form a wall of predetermined thickness of build-up material on the parent member.

4,798,931

SIMULTANEOUSLY CUTTING AND WELDING SHEET METAL USING LASER ENERGY

Albert J. Hess, III, Westminster, Md., assignor to Laser Applications, Inc., Westminster, Md.

Filed Jul. 17, 1987, Ser. No. 74,864
Int. Cl.[4] B23K 26/00
U.S. Cl. 219—121.64 7 Claims



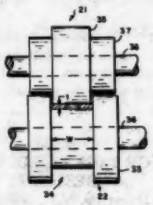
1. A method of simultaneously cutting and welding at least two sheets of metal, comprising the steps of overlaying said sheets of metal on each other, producing a focused beam of laser energy, subjecting the areas of said overlaid sheets along a line of progress where they are to be cut and welded to said focused beams of laser energy, providing a shield of inert gas around said laser beam; and selecting the operating parameters of at least said inert gas shield, said laser energy, and the speed of progress of said laser beam on said sheets along said line of progress with respect to at least the number, thicknesses and types of metals in said sheets so that a relatively narrow melt zone and cut is created along said line of progress, and so that surface tension on the molten metal in said melt zone after breakthrough will cause said molten metal in said melt zone on both sides of said line of progress to form smooth beads on the cut edges of said sheets on both sides of said line of progress.

4,798,932

SOLID PHASE EDGE BONDING OF METAL STRIPS

Paul A. Dion, North Attleboro, Mass., and Roderick L. Dair, Hope Valley, R.I., assignors to Polymetallurgical Corporation, Attleboro, Mass.

Continuation of Ser. No. 827,925, Feb. 10, 1986, abandoned.
This application Jul. 14, 1987, Ser. No. 73,852
Int. Cl.[4] B23K 20/04
U.S. Cl. 219—118 10 Claims



1. A method of solid-phase edge bonding a plurality of dissimilar metal strips comprising continuously feeding a plurality of thin flat strips of dissimilar metals into an edge-to-edge alignment in a single plane, said strips being substantially free from oxide and other contaminants, heating said strips to a solid-phase bonding temperature, and passing said heated and aligned strips between a pair of male and female reducing rollers, a plane of said aligned strips being maintained parallel to axes of said rollers, said rollers having coacting surfaces arranged to impart a thickness reduction to each of said strips of about 40 to 60% in a direction perpendicular to the axes of said rollers and to urge the adjacent side edges of said strips together by confining the lateral spread of said strips in a direction parallel to the axes of said rollers, thereby achieving a solid phase bonding of said strips only at said adjacent side edges.

4,798,933

SKI-BOOT HEATER

Giuseppe Annovi, Montebelluna, Italy, assignor to Dolomite S.p.A., Montebelluna, Italy

Filed Jun. 30, 1987, Ser. No. 68,087
Claims priority, application Italy, Jul. 3, 1986, 53595/86[U]
Int. Cl.[4] H05B 1/02
U.S. Cl. 219—211 6 Claims

1. A ski-boot heater comprising:

at least one heating resistor and at least one storage battery for mounting in a boot;

a socket for mounting in the boot in a position accessible from the exterior for connection to a source of D.C. voltage external of said boot for recharging said battery, and

control circuit means connecting said socket, said battery and said resistor for controlling supply of current to the resistor, including a manually-operable switch for controlling the supply of current from the at least one battery to the resistor,

wherein the control circuit means include a control and recharging circuit for enabling the supply of direct current to the resistor even when the at least one storage battery is connected through the socket to an external AC or DC electrical supply for recharging it, and

wherein the control circuit means are arranged to enable the heating resistor to be supplied with an electrical power greater than that normally supplied to the resistor as a result of the operation of the switch each time the at least one battery is being recharged.

4,798,934

ELECTRICAL VENTED HANDPIECE

Robert E. Boyer, 101 Patricia La., Prospect Heights, Ill. 60070

Filed Apr. 22, 1986, Ser. No. 855,077
Int. Cl.[4] H05B *1/00, 3/00*; B23K *3/04*
U.S. Cl. 219—233 **11 Claims**

1. A hand-held device having an electrically heated tip for applying heat to an object, said device being selectively useful such as for decorative burning, etching, sealing, and cutting, and comprising in combination:

(a) an exposed metal electrical resistance heating element forming a wire tip,

(b) terminal electrodes affixed to the ends of said heating element, said electrodes being connected through suitable leads to a source of electrical power to provide electrical energy to heat said tip,

(c) a metallic elongated and tubular handle, said handle being open at its forward and rear ends,

(d) an insulator mounting receiving said electrodes in fixed relation and disposed in said forward end of said handle to position said electrodes and said tip adjacent said forward end of said handle with said tip extending forwardly of said forward end,

(e) said handle having a plurality of raised and relatively-spaced longitudinally-extending vanes formed on the inner surface thereof, thereby forming elongated air spaces between said insulator and the inner surface of said handle, said vanes extending longitudinally within the tubular handle between said open forward end thereof,

(f) the front end of said air spaces being open to allow a flow of air to enter said air spaces,

(g) a plurality of openings formed in the rear of said tubular handle communicating with elongated air spaces from by said internal vanes whereby residual heat generated by said tip is vented from the rear end of said handle through said rear openings by said air flow, and thereby tend to maintain the temperature of said handle at a more comfortable level when the device is being used, and,

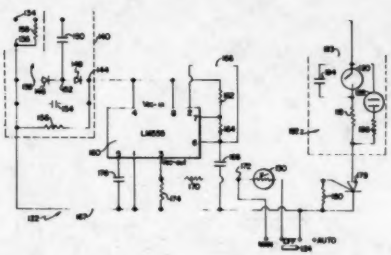
(h) a plurality of said vanes extending forwardly of said tubular handle as pronga engageable by said insulator to advance said insulator a distance from the forward end of said handle.

4,798,935

DRIVER CIRCUIT

Constantine D. Pezaris, Nahant, Mass., assignor to Environmental Fragrance Technologies, Ltd., New York, N.Y.

Filed Jul. 8, 1987, Ser. No. 70,977
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—272 **18 Claims**



1. A driver circuit responsive to an input AC voltage for applying said input AC voltage for a predetermined duration to a load, said driver circuit comprising means for receiving an input AC voltage, means for providing a DC voltage related to said input AC voltage, timing means responsive to said DC voltage for generating a continuous control signal for a selected time period which has a duration greater than one cycle of said input AC voltage and corresponding in duration to said predetermined duration, and control means receiving said control signal over said selected time period for applying said input AC voltage to said load through said control means when said input AC voltage is in the positive portion of its cycle, said input AC voltage applied to said control means when said input AC voltage is in both the positive and negative portions of its cycle.

4,798,936

WATERBED HEATER

Arthur K. Johnson, Sr., 655 S. Mesa Dr., #1041, Mesa, Ariz. 85202

Filed Aug. 14, 1986, Ser. No. 896,770
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—217 **35 Claims**

9. A heating unit for placement under the mattress of a waterbed, said unit comprising:

a plurality of heating pads electrically interconnected in parallel with one another;

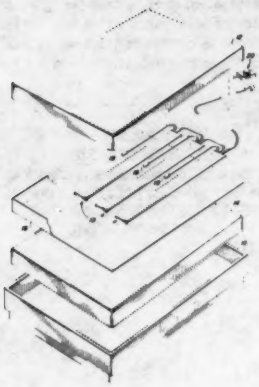
a plurality of heat sensors, one heat sensor associated with each heating pad, said sensors being electrically interconnected in series with one another;

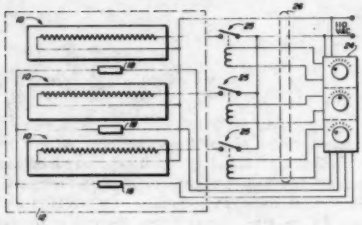
a switch means connected in parallel to said heating pads, said switch means applying voltage to said heating pads when closed;

a thermostat connected in series to said heat sensors, said thermostat controlling energization of said switch means; and

a plurality of lead wires connecting said pads and said sensors to said thermostat and a power supply;

whereby electrical power is supplied to said heating pads only when all of said sensors detect that the temperature





of the waterbed mattress has dropped below a predetermined value.

4,798,937

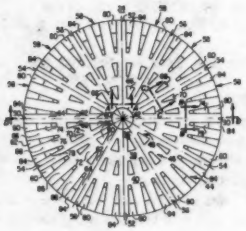
WARMER PLATE COVER

Raul Guerrero, 829 Leslie, Coppell, Tex. 75019

Filed Mar. 9, 1987, Ser. No. 23,536

Int. Cl.[4] H05B *3/74*

U.S. Cl. 219—433 **5 Claims**



1. In an automatic brewing device having an electrically heated warmer plate with a glass vessel supporting surface for maintaining a beverage at a constant elevated temperature and a spacer positioned intermediate the warmer plate and glass vessel to prevent excessive heating of the beverage in the glass vessel, the improvement comprising:

a warmer plate cover means of rigid, heat resistant plastic material having a softness sufficient for reducing substantially glass vessel breakage during use, said warmer plate cover forming a spacer between the warmer plate and glass vessel and including a body portion having first and second opposing surfaces, the first opposing surface corresponding to the glass vessel supporting surface of the warmer plate, and the second opposing surface including a substantially flat surface portion having a plurality of spaced, concentric grooves about a center portion for dividing the flat surface portion into a plurality of rings about the center portion, a plurality of spaced radial grooves extending from the groove defining the center portion for dividing each ring of the plurality of rings into a plurality of circle sector segments with said uniformly shaped circle sector segments of the ring adjacdnt to the Center portion having a preselected size defined by surrounding grooves, and each additional ring of circle sector segments having increasing numbers of radial grooves interconnecting adjacent ring forming grooves for dividing the rings of circle sector segments into increasing number of uniformly shaped circle segments, all of said grooves being in open communication with each other and coacting with a bottom of the glass vessel for forming hot air passages producing uniform heat distribution throughout the warmer cover plate for alleviating heat generated stresses within the glass vessel while maintaining the beverage temperature uniformly below the brewing temperature.

4,798,938

TEMPERATURE CONTROL APPARATUS FOR A BAKING OVEN

Julius Husslein, Vachendorf; Günther Wittauer, Traunreut; Helmut Knoll, Hufschlag, and Robert Dandl, Tacherting, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeraete GmbH, Munich, Fed. Rep. of Germany

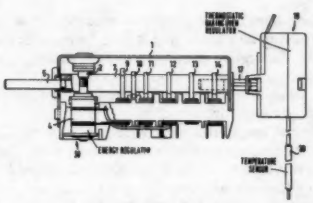
Continuation of Ser. No. 770,693, Aug. 29, 1985, abandoned.

This application Dec. 9, 1987, Ser. No. 131,338

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431740

Int. Cl.[4] A21B *1/00, 1/22*

U.S. Cl. 219—395 **15 Claims**

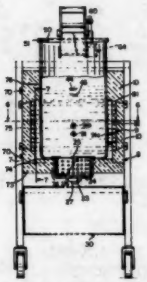


1. Temperature control apparatus for a oven having a baking heating element for heating the baking oven, said temperature control apparatus comprising a grill heating element disposed in the baking oven, a first thermostatic baking oven regulator manually settable to different temperatures for regulating said baking heating element, a second regulator manually settable to different heating stages for regulating said grill heating element, and a single setting device for setting and operating said first and second regulators, said setting device having a first control range in which said first regulator is adjustably controlled and a second control range in which said second regulator is adjustably controlled, said first and second control range being mutually exclusive, and said first and second regulators each being continuously variable within each range, and controlled mutually exclusively.

4,798,939
PRESSURIZED LIQUID COOKER WITH INTEGRATED RADIANT HEATING APPARATUS

Louis Nett, Cambridge, Wis., assignor to Gallina Corporation, Waukesha, Wis.

Filed Apr. 2, 1986, Ser. No. 847,161
Int. Cl.[4] F27D *11/02*
U.S. Cl. 219—438 13 Claims



1. A pressurized deep oil cooker comprising

an elongated cooking pot formed of a heat transmitting material and having a removable cover means, said pot being adapted to contain a cooking oil at a selected cooking temperature,

radiant heater means spaced from said cooking pot for heating of said cooking pot by radiant energy, and

a thermal insulating jacket encircling said heater means and having a side wall spaced from said pot and opposite end walls projecting inwardly abutting engagement with said pot and defining a transfer chamber between the jacket and the outer wall of said pot and operable to establish a heat level substantially greater than the selected cooking temperature and thereby heating the pot and oil in said pot, said thermal insulating jacket including a high temperature insulation having an inner surface of said side wall spaced from and directly exposed to said outer wall of said pot, said radiant heater means including a high temperature spiral wound coil having a plurality of coil turns, said coil being wound about said pot and spaced along the length of the pot to establish an essentially uniform heat input to said chamber and said coil turns embedded within said insulation and directly engaging said insulation with insulation filling the coil turns and having said coil turns exposed only at the inner surface of said insulation, and

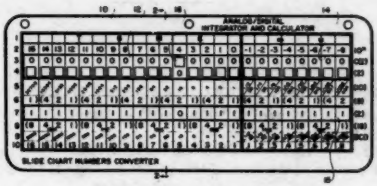
control means to energize said heater means and raise the temperature in said chamber and of said pot and thereby raise the temperature of the cooking liquid to a preselected uniform cooking temperature.

4,798,940
MANUAL CALCULATOR FOR ANALOG AND DIGITAL NUMBERS

Gaetano Salvo, 3748 Michigan Ave., Charlotte, N.C. 28215

Filed Aug. 19, 1986, Ser. No. 897,975
Int. Cl.[4] G06G *1/02*
U.S. Cl. 235—70 R 12 Claims

1. A manual calculator useful in registering numbers and converting whole and fractional numbers from one numbering system to another numbering system and comprising means for defining a cover having a predetermined configuration and a plurality of slide members arranged in an array within said cover means, each said slide member being movable relative to said cover means between first and second positions, said slide member each bearing indicia indicative of a selected one of two states, said cover means defining an elongate window in which the indicia borne by the slide members are visible in an array indicative of a selected number series in a first numbering system, and said cover means bearing a plurality of sets of indicia with each set having a predetermined correlation to number series expressed in a differing preselected numbering system, said sets of indicia being arranged relative to said window and said slide members with each set in a correspond-

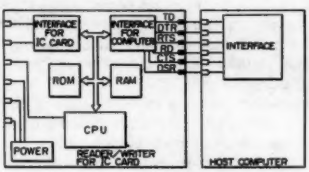


ing row parallel to said window and said plurality of sets in columns perpendicular to the direction of movement of said slide members and with numerical values in each said system aligned with a corresponding one of said slide members whereby the positioned of said slide members may be manipulated to indicate a number series in a first numbering system and corresponding number series in different numbering systems.

4,798,941
IC CARD

Hiroshi Watanabe, Kokubunji, Japan, assignor to 501 Toppan Moore Company, Ltd., Tokyo, Japan

PCT No. PCT/JP86/00126, § 371 Date Oct. 24, 1986, § 102(e) Date Oct. 24, 1986, PCT Pub. No. WO86/05613, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 13, 1986, Ser. No. 932,212
Claims priority, application Japan, Mar. 14, 1985, 60-51015
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 13 Claims



1. An IC card having at least control means and storage means, wherein said storage means comprises:

a storage area for storing information thereon;

a secret identification number area for storing at least one predetermined secret identification number thereon; and

an error count area for storing the number of times of improper input of the secret identification number thereon, and wherein said control means comprises:

comparison means for comparing a supplied secret identification number with said predetermined secret identification number stored on said secret identification number area;

means for accessing said storage area when said comparison means indicates coincident as a result of comparison;

error count means for storing the number of times of discrepancy into said error count area when said comparison means indicates discrepancy as a result of comparison;

storage area lock means for inhibiting access to said storage

area when said error count means has counted a predetermined number of time; and

unlock means for invalidating the count of said error count area to release said storage area lock means, on the basis of at least one specific input signal after the count of said error count area has counted said predetermined number.

4,798,942

EASY ACCESS TICKET TRANSPORT MECHANISM

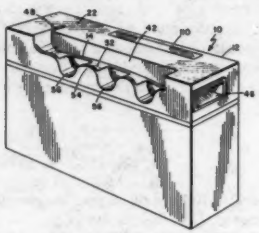
Kenneth R. Aubrey, San Diego, Calif., assignor to Cubic Western Data, San Diego, Calif.

Filed Feb. 21, 1986, Ser. No. 831,713

The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.

Int. Cl.[4] G06K *13/063, 13/07*

U.S. Cl. 235—384 **12 Claims**



1. A ticket transport mechanism for receiving and processing tickets from a patron, comprising:

ticket transport means for moving tickets at a predetermined speed along a ticket path through the mechanism;

the transport means having an open longitudinal slot comprising means for guiding a ticket along the ticket path with a portion of the ticket projecting out of the slot, the slot having an entry opening at one end for receiving tickets and further including ticket moving means for grasping a ticket at the entry opening and moving the ticket along the slot;

stop means for engaging an outer edge of the projecting portion of a ticket in the slot to restrict movement of the ticket transversely out of the slot; and

processing means for processing information from a ticket travelling along the slot.

4,798,943

METHOD AND SYSTEM FOR CONTROL OF A BAR CODE SCANNER THRESHOLD

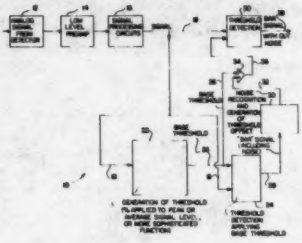
Craig D. Cherry, Eugene, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Sep. 30, 1986, Ser. No. 913,728

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—463 **13 Claims**

1. In a bar code scanner having a variable black/white scan signal processing transition threshold derived from a function of the reflected light levels received by the scanner, said variable threshold being subject to threshold decay, a method for controlling threshold to produce a substantially noise-free bar signal, comprising, monitoring selected scan signal characteristics and determining, electronically, whether sets of signal characteristics represent a bar code or extraneous noise, and if



a set of signal characteristics indicates noise, raising the black/white threshold value level until noise is no longer detected.

4,798,944

DOCUMENT ENCODING DEVICE WITH DOCUMENT READING STATION AND DOCUMENT VIEWING STATION

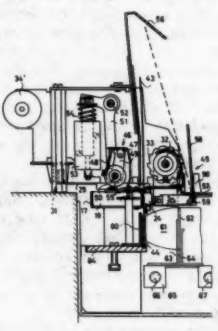
Horst Görner, St. Georgen, and Horst Dyma, Villingen-Schwenningen, both of Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Villingen, Fed. Rep. of Germany

Filed Dec. 24, 1985, Ser. No. 812,969

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447429

Int. Cl.[4] G06K *13/00*

U.S. Cl. 235—475 **13 Claims**



1. Document encoding device with a reading station for the mechanical reading of pre-encoded marks, a viewing station following the reading station for stopping the document for the visual reading of handwritten marks, and at least one adjoining station following the viewing station for subsequent processing of said documents, transporting means for moving said documents between said reading, viewing and processing stations, wherein the improvement comprises that said transporting means comprises a first transporting means, a second transporting means, and a third transporting means, said document being moved by said first transporting means in a first transporting direction into said reading station, said documents being moved by said second transporting means in a second transporting direction transverse relative to said first transporting direction with the viewing and reading stations arranged one behind the other in a viewing direction generally transverse to the first transporting direction and with the viewing station arranged closer to a viewer relative to the reading station, and said third transporting means moving said docu-

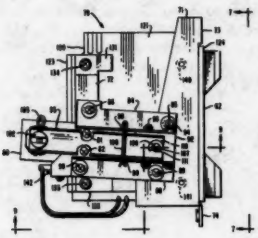
ments from said viewing station to said at least one processing station.

4,798,945

GRABBER MECHANISM FOR A BADGE READER TERMINAL

Ronald L. Bruckner, Longwood, and James W. Driscoll, Sanford, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 30, 1987, Ser. No. 8,793
Int. Cl.[4] G06K *13/00, 7/00*
U.S. Cl. 235—479 **11 Claims**



1. A grabber mechanism in a badge reader for grabbing a card to be read thereby, said grabber mechanism comprising:

a lever bar having a first end and a second end;

pivot means intermediate said first and second ends of said lever bar about which said lever bar may rotate from a first position to a second position;

a solenoid connected to said first end of said lever bar, said solenoid for moving said first end when energized such that said lever bar is moved from its first position to its second position;

grabber means having a proximate end attached to said second end of said lever bar, and a distal end;

spring means which normal urgency is overcome when said lever bar is rotated from its first position to its second position by said solenoid, and which urges said grabber means and moves said attached second end of said lever bar from its second position toward its first position when said solenoid is not energized; and

a fixed partition having a plane generally normal to said distal end of said grabber means and positioned at a location proximate to the location of said distal end when said lever bar is in its second position such that when said lever bar moves to its second position, said distal end moves away from said fixed partition allowing a card to be read to be slidably moved between said distal end and said fixed partition, and when said lever bar moves toward its first position from its second position the card to be read is grabbed and held between said distal end and said fixed partition responsive to the urging of said spring means.

4,798,946

PLASTIC PACKAGE FOR AN IC CARD

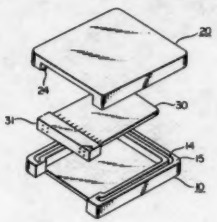
Noriaki Fujii; Mamoru Kitamura, both of Itami, and Akira Yamada, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 3, 1988, Ser. No. 151,982
Claims priority, application Japan, Apr. 9, 1987, 62-87802; Sep. 17, 1987, 62-230982
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 **16 Claims**

1. A plastic package for an IC card comprising:

a first package section which is made of plastic and has a flat base and a rim which projects upwards from one side of said base and extends along the periphery of said base, the top surface of said rim having formed therein a first engaging portion comprising at least one depression;

a second package section which is made of plastic and has a flat base and a rim which projects upwards from one side of the base of said second package section and extends along the periphery of the base of said second package section, the top surface of the rim of said second package section having formed therein a second engaging portion comprising at least one projection, said first and second



package sections being combined with one another with the top surfaces of said rims in intimate contact with one another and with said first and second engaging portions engaged with one another; and

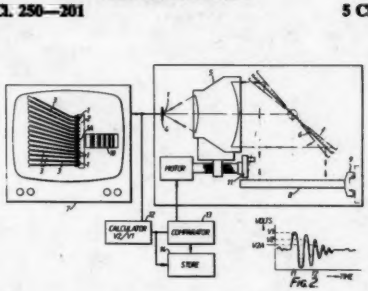
a bonding agent which is applied to the depression of said first engaging portion before it is engaged with the projection of said second engaging portion, said first and second engaging portions being bonded together by said bonding agent.

4,798,947

FOCUSING TECHNIQUE FOR AN OPTICAL SENSING SYSTEM

Ivor R. Baxter, Brentwood, England, assignor to The General Electric Company, p.l.c., Essex, England

Filed Oct. 19, 1987, Ser. No. 109,583
Claims priority, application United Kingdom, Oct. 18, 1986, 8625031
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **5 Claims**



2. An optical sensing system comprising a focussing device for producing an image of a scene, sensing means arranged to receive the image, means for causing radiation emitted from the sensing means, after passing via the focussing means, to be reflected back through the focussing device to the sensing means; and control means for using the resulting output of the sensing means to control the focussing means.

4,798,948

FIELD STOP FOR DARK FIELD ILLUMINATION IN AUTOFOCUS OPTICAL DEVICE

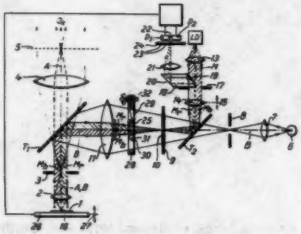
Burkhard Neumann, and Hans-Werner Stankewitz, both of Wetzlar, Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Apr. 17, 1987, Ser. No. 39,249

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614676; May 23, 1986, 3617421

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 22 Claims



1. In an incident light optical device capable of dark field illumination and including an incident light beam comprised of at least first and second partial beams which are coextensive in at least a central region of said incident light beam and which differ with regard to their respective wavelengths, or wavelength ranges, said second one of said partial beams comprising an autofocus measurement beam;

a one-piece field stop component, comprising a lens element means for insertion into the central region of the incident light-beam and for changing the beam cross-section (converging and diverging), said lens element means blocking the wavelength of said first partial beam and transmitting the wave length of said second partial beam; and means for selectively interposing said lens element means into the central region of said incident light beam.

4,798,949

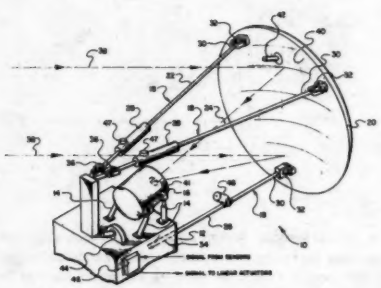
LINEAR ACTUATED OPTICAL CONCENTRATOR

William W. Wilcox, Simi Valley, and Charles T. Kudija, Jr., Canyon Country, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1986, Ser. No. 917,339

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—203 R 20 Claims



1. An apparatus for pointing an optical concentrator in a desired orientation to focal point equipment, in an extraterrestrial environment, comprising:

a base for rigidly supporting said focal point equipment; and

at least three support means for connecting said optical concentrator to said base and including actuation means for providing differential motion between said base and said optical concentrator, said support means further including gimballing means for accommodating said differential motion and independently gimballing the optical concentrator with respect to the focal point equipment.

4,798,950

RADIATION CHARACTERISTIC MEASURING APPARATUS FOR LASER DIODE

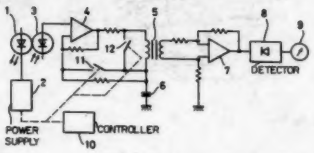
Takuya Hosoda; Shoji Adachi, and Atsushi Kudo, all of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1986, Ser. No. 904,122

Claims priority, application Japan, Sep. 5, 1985, 60-196757

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—214 A 2 Claims



1. Apparatus for measuring a radiation characteristic of a laser diode, in which an ac signal and a step-like dc voltage are applied to the laser diode and in which the radiant power output of said laser diode is received by a photodiode, comprising:

a first amplifier having two inputs one of which is connected to the output of the photo diode for amplifying the output signal of said photo diode;

a transformer including primary and secondary windings for extracting said ac signal, said primary winding being connected in series with the output of said first amplifier;

a capacitor connected in series with the preliminary winding;

an ac amplifier connected across the secondary winding of the transformer for amplifying ac signals derived from the secondary of the transformer;

a first switch connected to the other input of the first amplifier and to a junction between the primary winding of the transformer and the capacitor; and

a second switch connected across the primary winding of a transformer and to the junction between the first switch and the capacitor; and

means for applying a stepped dc voltage signal superimposed with an ac signal to said laser diode for predetermined step periods and for simultaneously closing said first and second switches for a shorter time period than individual step periods thereby applying the dc voltage to the capacitor to charge it while the primary circuit of the transformer is short circuited.

4,798,951

FIBER OPTIC DISPLACEMENT TRANSDUCER WITH DICHROIC TARGET

Frederick J. Walker, Bethel, Conn., assignor to Consolidated Controls Corporation, Bethel, Conn.

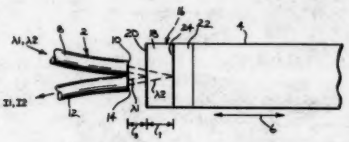
Filed Dec. 14, 1987, Ser. No. 132,409

Int. Cl.[4] G01B *11/00*

U.S. Cl. 250—227 4 Claims

1. A fiber optic displacement transducer comprising a target movable in an axial direction, a sender fiber optic cable having a light emitting end axially spaced from said target a receiver fiber optic cable having a light receiving end axially spaced

from said target, optical filter means on said target having a first surface reflecting light of a first wavelength from said sender cable to said receiver cable, said optical filter means having a second surface axially spaced from said first surface by a fixed distance t and reflecting light of a second wavelength from said sender cable to said receiver cable, where I1 is the intensity of said first wavelength light in said receiver



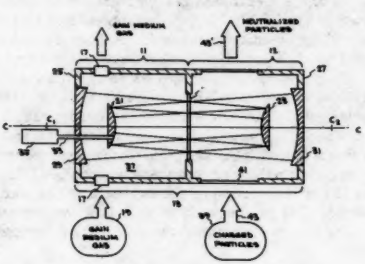
cable and I2 is the intensity of said second wavelength light in said receiver cable, and wherein $I1(I2-I1)\times t$ varies linearly with axial separation s of said cable ends from said target over a given range of s, such that changes in transmitted light intensity due to optical disturbances in said sender cable cancel out of said fraction $I1/(I2-I1)$ whereby to prevent a false reading of s as measured by $I1/(I2-I1)\times t$, because t is fixed.

4,798,952

ASTABLE RESONATOR PHOTONEUTRALIZATION APPARATUS

Joel H. Fink, Hayward, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 19, 1987, Ser. No. 51,561
Int. Cl.[4] G01N *27/78*
U.S. Cl. 250—251 **29 Claims**



1. Apparatus for photoneutralization of an atomic or molecular beam of negatively charged particles, the apparatus comprising:

an optical cavity including first and second end walls, spaced apart and facing one another and having a longitudinal axis extending therebetween;

first and second, substantially identical, convex mirrors, spaced apart within the optical cavity and facing one another along the optical cavity longitudinal axis, with the first and second convex mirrors being adjacent to but spaced apart from the first and second end walls, respectively;

first and second, substantially identical concave mirrors, positioned at the first end wall and at the second end wall, respectively, within the optical cavity and facing one another along the longitudinal axis of the optical cavity;

an optical gain cavity that includes the first end wall and the first convex mirror;

a photoneutralization region that includes the second end wall and the second convex mirror, with the optical gain cavity being separated from the photoneutralization region by an optical window that provides a substantially gas-tight seal and is transparent to radiation of a predetermined wavelength $\lambda=\lambda_r$;

gas excitation means, operatively associated with the optical gain cavity, to excite a gas contained in this cavity;

optical gain gas source and inflow/outflow means, operatively associated with and adjacent to the optical gain cavity, to make gas available, admit gas into, and allow gas to exit from, the optical gain cavity, where the gas is chosen to permit emission of electromagnetic radiation of wavelength λ_r when the gas is excited by the gas excitation means;

an electromagnetic radiation beam source and beam input means, operatively associated with the optical cavity, to produce an electromagnetic radiation beam of wavelength substantially λ_r and to direct this beam into the optical cavity substantially parallel to the direction of the optical cavity longitudinal axis; and

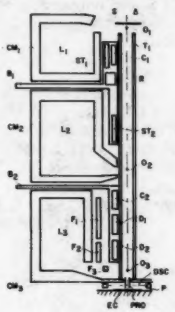
a charged particle beam source and beam input means, positioned adjacent to the optical cavity and oriented to produce and direct a beam of negatively charged atomic or molecular particles through the photoneutralization region in a direction substantially transverse to the direction of the longitudinal axis of the optical cavity.

4,798,953

ELECTRONIC BEAM DEVICE FOR PROJECTING AN IMAGE OF AN OBJECT ON A SAMPLE

Emmanuel de Chambost, Molieres, France, assignor to THOMSON-CSF, Paris, France

Filed Apr. 13, 1987, Ser. No. 37,343
Claims priority, application France, Apr. 15, 1986, 86 05363
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—310 **9 Claims**



1. An electronic beam optical device for projecting the image of an object onto a sample plane, said beam having an axis of symmetry, said device comprising:

a single insulating tube having an inner metalized face for protecting the path of the electron beam, said tube being continuous without interruption and empty of all apparatus, the tube having an axis which coincides with the beam axis;

a first lens arranged around said tube and having a pole piece and an optical center on the axis of the tube, said first lens being arranged between the object and the sample plane;

a second lens being arranged around said tube and having a pole piece and an optical center on the axis of the tube, said second lens being arranged between said first lens and said sample plane, for reducing the image of the object;

a third lens being arranged around said tube and having a pole piece and an optical center on the axis of the tube, said third lens being arranged between said first lens and said sample plane, for reducing the image of the object;

said first lens adjusting the image of the object in the optical center of said third lens; and

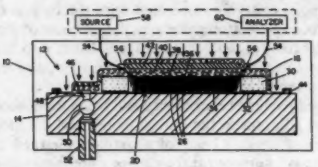
said tube extending from the object to the bottom of the pole piece of said third lens.

4,798,954

MONITORING TECHNOLOGY

William A. Stevenson, Concord, Mass., assignor to Foster-Miller, Inc., Waltham, Mass.

Filed Feb. 3, 1987, Ser. No. 10,306
Int. Cl.[4] G01N *21/35, 21/84*
U.S. Cl. 250—341 20 Claims



1. An infrared spectroscopy system for monitoring the processing of a polymeric material comprising

a source of infrared radiation for generating a beam of infrared radiation,

infrared spectrum analyzing means,

an infrared radiation transmission fiber that has a transmission portion and a sensor portion adapted to be embedded in the polymeric material to be monitored, and

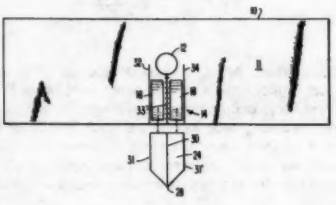
means for coupling said transmission fiber to said source to transmit a beam of infrared radiation through said fiber to said sensor portion and for coupling said fiber to said infrared spectrum analyzing means for analyzing the resulting spectra as said polymeric material is processed to provide kinetic information on the processing of said polymeric material.

4,798,955

MEASUREMENT LOCATOR AND LIGHT SHIELD FOR USE IN INTERACTANCE TESTING OF BODY COMPOSITION AND METHOD FOR USE THEREOF

Robert D. Rosenthal, Gaithersburg, Md., assignor to Futrex, Inc., Gaithersburg, Md.

Filed Sep. 23, 1987, Ser. No. 100,226
Int. Cl.[4] G01N *21/01*
U.S. Cl. 250—341 7 Claims



1. A light barrier and probe location device for use with a near infrared radiation interactance probe for measuring body composition on the upper arm of an individual, the device comprising:

(a) a piece of drapable, flexible opaque material having an opening therein for receipt of the probe at a predetermined position, the material being sufficiently large to overwrap the arm of an individual to be tested,

(b) adjustable fastening means on the piece of opaque material for removably attaching the piece of opaque material around the upper arm of an individual and allowing it to be held in place to exclude light to a probe inserted into the opening during the test and to be separated for removal from the arm after the test, and

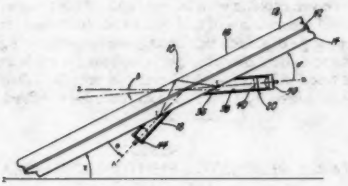
(c) a probe location member attached to the piece of opaque material in a position to determine the precise location of the probe opening when the opaque drape engages the individual's upturned arm, the probe location member locating on the inside of the elbow of the individual.

4,798,956

ELECTRO-OPTICAL WINDSHIELD MOISTURE SENSING

Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098

Filed Jul. 15, 1987, Ser. No. 73,496
Int. Cl.[4] G01N *21/41*
U.S. Cl. 250—341 28 Claims



1. A sensing assembly (10) using radiant energy for indicating when moisture or other particles have accumulated on a window (12) having inside and outside surfaces (16) thickness (T) and of a material having an index of refraction (n) associated with the wavelength of the radiant energy, said assembly (10) comprising: emitter means (18) for disposition on the inside of the window (12) with gas therebetween to emit radiant energy to the window (12) on an ingress axis (A) at an incident angle (θ) relative to the inside surface (14), detector means (20) for disposition on the inside of the window (12) with gas therebetween to detect radiant energy from the window (12) on an engress axis (B) at a reflecton angle (θ') relative to the inside surface (14) and equal to said incident angle (θ), support means (22) for spacing said emitter means (18) and said detector means (20) such that the point (I) of intersection of the ingress axis (A) with the inner surface of the window (12) from the point (E) of intersection of the engress axis (B) with the inside surface (14) of the window (12) is a predetermined distance (D), said predetermined distance (D) determined by the formula:

$$D=2\,T\cos\theta\,(n^2-\cos^2\theta)^{-\frac{1}{2}}$$

4,798,957

ELECTRON BEAM APPARATUS COMPRISING AN ANODE WHICH IS INCLUDED IN THE CATHODE/WEHNELT UNIT

Harm Tolner, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 818,153, Jan. 13, 1986, abandoned. This application Dec. 7, 1987, Ser. No. 131,252
Claims priority, application Netherlands, Mar. 28, 1985, 8500906
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—396 R 10 Claims

1. An electron beam apparatus comprising

cathode means for emitting an electron beam,

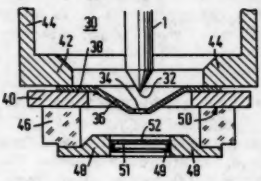
a Wehnelt cylinder electrode having an aperture for passing said electron beam,

wherein said cathode means and said Wehnelt cylinder electrode are disposed together as a separate unitary structure within the electron beam apparatus to pass said elec-

tron beam in a direction parallel to the longitudinal axis of the electron beam apparatus,

anode means for shaping said electron beam, said anode means including an anode holder and at least one anode plate having an anode bore, said anode bore providing a beam aperture for said electron beam, wherein said anode means operates with an anode voltage of at most 5 KV,

electrically insulating structural means between said anode means and said unitary structure for mounting said anode



means integrally and rigidly to said unitary structure to form a composite structure of said cathode means, said Wehnelt cylinder electrode, and said anode means in said direction parallel to the longitudinal axis of the electron beam apparatus, wherein said electrically insulating structural means is a cylindrical structure,

and wherein said electrically insulating structural means is a ceramic ring, and

electron-optical means for aligning and modulating said electron beam.

4,798,958

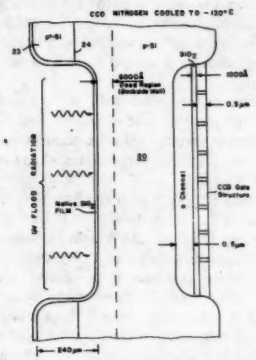
CCD IMAGING SENSORS

James R. Janesick, La Canada, and Stythe T. Elliott, Sun Valley, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 642,417, Aug. 20, 1984, abandoned. This application Mar. 27, 1987, Ser. No. 31,198

Int. Cl.[4] G01T *1/24*; H01L *29/78, 27/14*; G11C *11/34*

U.S. Cl. 250—370.01 **11 Claims**



1. A method for storing and reading out information in a buried channel charge-coupled-device imaging sensor having an oxide layer on the front side over an array of pixels in a layer of photosensitive semiconductor produced on a substrate material, and charge transfer gates for reading out image charges from wells of said array of pixels, comprising the steps of storing said analog information as positive states in said oxide layer created by ionization radiation in a desired pattern with conveys said information, and repeatedly reading out said information stored in said oxide layer by first clearing said charge-coupled-device pixel wells by using conventional charge transfer procedures for image readout from said charge-coupled-device, then driving the gate bias potential of every charge-coupled-device pixel well to a potential more negative than required for imaging and sufficient to reach an inversion level where excess charge current flows at sites of said positive states through the oxide layer into said pixel wells as leakage current in the stored pattern, and thereafter, having integrated excess charge current in said pixel wells, reading said analog information from said pixel wells by using conventional charge transfer procedures for image readout from said charge-coupled-device, thus clearing said pixel array for subsequent imaging in a conventional way.

4,798,959

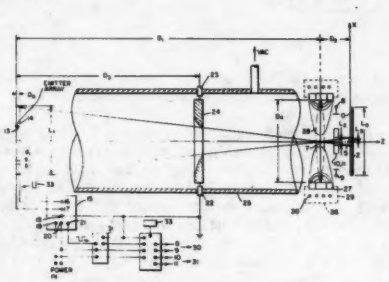
SUPER SUBMICRON ELECTRON BEAM WRITER

Alvin M. Marks, Bigelow Rd., Athol, Mass. 01331

Filed Jan. 2, 1987, Ser. No. 1,330

Int. Cl.[4] H01J *37/30*

U.S. Cl. 250—492.2 **16 Claims**



1. In a submicron beam writer for the simultaneous inscription of multiple patterns onto a substrate surface, a first cylinder having an OZ axis in an OXYZ coordinate system, first and second planes normal to said axis at the ends of said cylinder spaced a distance D apart, a vacuum in said first cylinder, a plurality of emitters in an array at said first plane, a third plane between said first and second planes, said third plane being spaced a small distance D_o from said first plane and parallel thereto, a plurality of first anodes in said third plane, each said first anode being concentric with a said emitter, a substrate sheet having an Area A_1, a surface on said substrate sheet, said surface being coincident with said second plane, an electric power source of voltage V_1, said voltage V_1 being applied between said emitters and said first anodes causing the emission of an electron beam from each said emitter, a second anode, an electric power source of high voltage V_o applied between said emitters and said second anode, an electron optics lens, said lens projecting a demagnified image of said emitter array onto said substrate surface, main scanning means, subsidiary scanning means, said main scanning means causing a stop-go scanning motion of said demagnified image over said substrate surface, an Area A_3 surrounding each said emitter image, each said emitter image comprising a pixel, said subsidiary scanning means simultaneously scanning each of said pixels over their corresponding Areas A_3 during the "stop" portions of the said main scan on said substrate surface, and blanking said images during said "go" portions of the said main scan, a microprocessor, a program, a pattern modulation voltage V_2 output from said microprocessor, said program controlling said voltage V_2, an amplifier, said voltage V_2 being applied to said amplifier, said voltage V_1 being modulated by said voltage V_2 during the "stop" portions of said main scan, said electron beams modifying the surface properties of the said surface, whereby a plurality of said patterns are inscribed on said substrate surface as variations in said properties.

4,798,960

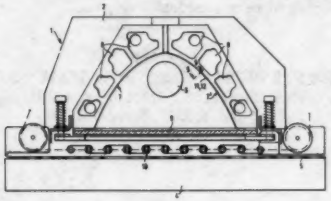
DEVICE FOR THE TREATMENT OF SUBSTANCES BY UV RADIATION

Heinz Keller; Martin Lehner, both of St. Gall, Switzerland; Reinhard Born, Bruchkobel, and Hans-Georg Lotz, Erlensee, both of Fed. Rep. of Germany, assignors to Ferd. Ruesch AG, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 887,554, Jul. 17, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 165,426

Int. Cl.[4] G01J *1/00*; G02B *5/24*

U.S. Cl. 250—504 R 5 Claims



1. A device for the treatment of material by UV radiation, comprising a housing having an upper section, an UV and heat radiating lamp in the upper section, the housing having an open lower section through which radiation from the lamp can pass, and a reflector in the housing and reflecting radiation from the lamp through the open lower section, the reflector having a polished metal reflecting surface having a heat-absorbing coating with an outermost surface formed of black chromium plating forming a dull surface, the heat-absorbing coating being covered by UV reflecting composite layers of vapor deposited layers of hafnium dioxide and silicon dioxide of which one is bonded to, said surface of the heat-absorbing coating.

4,798,961

DEVICE FOR RADIATION FIELD SHIELDING IN RADIOTHERAPY

Nils-Erik Augustsson, Fasanvägen 2, S-232 00 Åkarp, Sweden

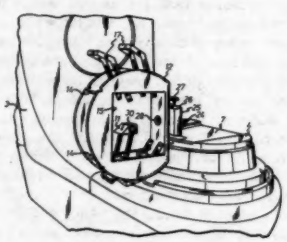
PCT No. PCT/SE86/00514, § 371 Date Jul. 9, 1987, § 102(e) Date Jul. 9, 1987, PCT Pub. No. WO87/02897, PCT Pub. Date May 21, 1987

PCT Filed Nov. 11, 1986, Ser. No. 81,006

Claims priority, application Sweden, Nov. 11, 1985, 8505315

Int. Cl.[4] H05G *1/02*

U.S. Cl. 250—515.1 16 Claims



1. A device for shielding the field of radiation in a radiotherapy apparatus (1) comprising a frame (2) and a rotary member (3) rotatable about a first axis (A) and a collimator unit (4) having a second axis (B) which is rotatable in its entirety about said first axis (A) spaced apart from said collimator unit (4), such that the collimator unit is rotatable about a patient to be subjected to radiation, said device (5) being mounted on the collimator unit (4) and comprising a holder (10) which supports at least one adjustable radiation shield means (11) spaced from the collimator unit (4), said device (5) having a shaft assembly (24) which is mounted on the collimator unit (4) and on which the holder (10) is mounted, characterized in that the shaft assembly (24) comprises two shafts (26, 28) having axes substantially at right angles to each other, the holder (10) being pivotable about one (26) of said shafts from a first position in front of the collimator unit (4), such that radiation passing through the collimator unit passes through an opening in the holder, to a second position in which the holder (10) is pivoted away from the collimator unit (4) and in which the holder is rotatable in its entirety about the axis of the other shaft (28).

4,798,962

MULTI-WAVELENGTH PROJECTION EXPOSURE AND ALIGNMENT APPARATUS

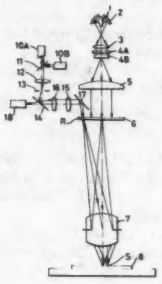
Koichi Matsumoto, Tokyo; Yutaka Suenaga, Kawasaki; Makoto Uehara, Tokyo, and Kiyoyuki Muramatsu, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 18, 1987, Ser. No. 16,120

Claims priority, application Japan, Feb. 24, 1986, 61-38852

Int. Cl.[4] G01B *11/00*

U.S. Cl. 250—548 13 Claims



4. A projection exposure apparatus for holding a wafer, which has a first alignment mark, and for holding a reticle, which is formed by a light transferring portion and a light shielding portion and has a second alignment mark and a pattern, comprising:

illuminating means provided with an illuminating optical system for illuminating said reticle by first light having a first wavelength through said illuminating optical system;

a projection optical system disposed between said reticle and said wafer; and

alignment means provided with an alignment optical system and alignment detecting means for illuminating said second alignment mark of said reticle by second light of a second wavelength through said alignment optical system and for detecting the relative positional relationship between said reticle and said wafer, said alignment detecting means detecting an image of said second alignment mark through said alignment optical system and detecting an image of said first alignment mark through said projection optical system and said alignment optical system, said second wavelength being longer than said first wavelength;

said projection optical system having two extremums of axial chromatic aberration as a function of wavelength of light, said first wavelength being substantially equal to the shorter one of two wavelengths corresponding to said two extremums, the value of axial chromatic aberration of the extremum corresponding to the shorter one of two wavelengths corresponding to said two extremums being substantially equal to zero, the value of axial chromatic aber-

ration of said projection optical system corresponding to said second wavelength being substantially equal to zero.

4,798,963

APPARATUS FOR MONITORING AND MEASURING THE QUALITY OF RAIL WHEEL STILL MOUNTED BENEATH A RAIL VEHICLE WITHOUT DIRECTLY CONTACTING THE RAIL WHEELS

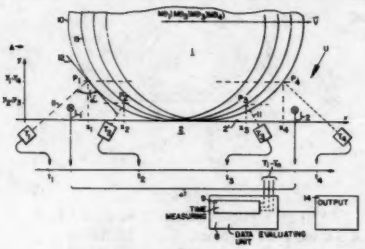
Helmut Wittkopp, Erkelenz; Helmut Grutesser, Wassenberg-Birgelen; Wilfred Coenen, Monchen-Gladbach, and Walter Elschenbroich, Erkelenz, all of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Aug. 4, 1986, Ser. No. 893,365

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1985, 3528875; European Pat. Off., Mar. 24, 1986, 86104028.5

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—560 **56 Claims**



1. An apparatus for measuring of wheels of rail vehicles, comprising a measuring range (X) provided along a rail track and having auxiliary rails (2, 16, 58, 112) forming running surfaces (2', 16', 68, 107) for said wheels, at least one wheel diameter measuring device (U) located in said measuring range for providing first electrical signals suitable for ascertaining the diameter of a wheel or wheels, a wheel tread profile sensing device (W) located in said measuring range (X) for providing second electrical signals suitable for ascertaining the quality of a wheel tread profile, wherein both devices (U and W) perform their function during a relative motion between the respective wheel (1, 18, 25) and the measuring apparatus, and data processing signal evaluating means connected to both devices (U, W) for providing an information output regarding the wheel diameter and regarding the wheel tread profile quality.

4,798,964

METHOD AND APPARATUS FOR THE CONTACTLESS MEASURING OF THE TREAD QUALITY OF RAILROAD

Harald Schmalfuss, Rodgau; Friedel Sinsel, Frankfurt, and Hubertus Kurpiella, Eschborn, all of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Aug. 4, 1986, Ser. No. 893,160

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1985, 3528873; European Pat. Off., Mar. 24, 1986, 86104027.7

Int. Cl.[4] G01V *9/04*

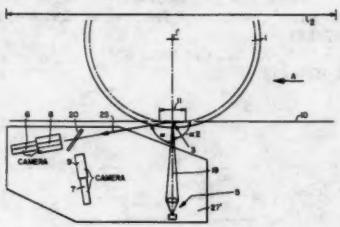
U.S. Cl. 250—560 **34 Claims**

1. A method for measuring in a contactless manner the tread quality of a circumferential tread surface of a railroad wheel having a rotational axis, comprising the following steps:

(a) illuminating the circumferential tread surface of said railroad wheel by directing light in an approximately radial direction onto said circumferential tread surface for producing a light section image of said wheel circumferential tread surface, said light section image extending substantially in parallel to said rotational axis of said railroad wheel,

(b) sensing said light section image for producing electrical analog signals representing said tread quality,

(c) digitizing said electrical analog signals for producing digital signals representing said tread quality, and



(d) evaluating said digital signals for providing information output signals representing said tread quality.

4,798,965

OPTICAL AUTOCOLLIMATION MEASURING APPARATUS

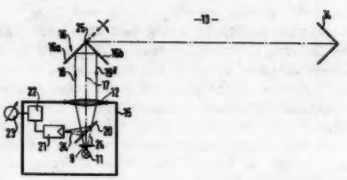
Günter Fetzer, Gundelfingen, and Klaus Smetana, Windenreute, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Jun. 24, 1987, Ser. No. 65,804

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1986, 3624380; Aug. 5, 1986, 3626524

Int. Cl.[4] G01N *15/06*

U.S. Cl. 250—573 **11 Claims**

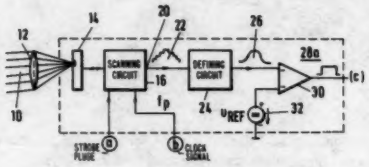


1. Optical autocollimation measuring apparatus, in particular transmission measuring apparatus, comprising a light transmitter-receiver arranged in a housing and having a light source which transmits a light beam via a beam divider and an optical system over a measurement path to a retroreflector with the retroreflector reflecting the incident light substantially back on itself to the light transmitter-receiver so that it falls on the beam divider and is deflected by the latter to a photoreceiver to which an electronic processing circuit is connected, which delivers from the electrical output signal of the photoreceiver an indication representative of the optical state along the measurement path, characterised in that a deflecting mirror (16) is arranged between the front objective (12) and the measurement path (13) and consists of two parts (16*a*, 16*b*) which adjoin one another along a straight line standing perpendicular to the optical axis (17), with the parts being pivotable relative to one another about a pivot axis coinciding with the straight line in such a way that by rotating one part (16*b*) relative to the other part (16*a*) the light incident on the mirror is retroreflected in one dimension.

4,798,966
OPTICAL SENSOR ARRANGEMENT

Wilhelm Duis, Hetlingen, Fed. Rep. of Germany, assignor to J. D. Möller Optische Werke GmbH, Wedel, Fed. Rep. of Germany

Filed Sep. 22, 1986, Ser. No. 910,206
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536853
Int. Cl.[4] H01J 40/14
U.S. Cl. 250—578 6 Claims



1. An optical sensor arrangement comprising

optical sensing means, including a plurality of identical sensor units arranged substantially equidistantly from one another in array;

means for issuing a clock signal;

a scanning circuit operative for scanning said sensor units and for producing a first signal in response to said clock signal in such a manner that the value of said first signal remains constant for a predetermined time interval following said clock signal;

defining means connected to said scanning circuit and receiving said first signal therefrom, said defining means including an integrating element and being operative for converting said first signal into a gradually changing converted signal having intermediate values between successive ones of the first signal values;

means for providing an additional clock signal having a frequency lower than that of said clock signal; and being connected to said scanning circuit; and

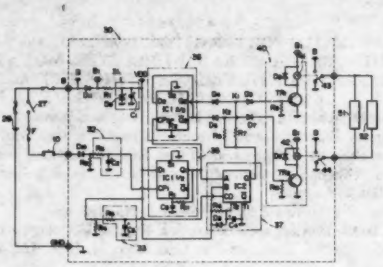
an evaluation circuit receiving said converted signal from said defining means and operative for generating from said converted signal a second signal indicative of the position of a light beam on said optical sensing means, said evaluation circuit including a comparator which compares the value of the converted signal with that of a reference signal and means issuing an output signal that changes its value when the value of the converted signal exceeds the value of said reference signal.

4,798,967
CONTROL SYSTEM FOR FOLDABLE OUTSIDE REARVIEW MIRROR

Tohru Yamana, Fujieda; Kiyoshi Nakayama, Shizuoka, and Kazuhiko Sato, Kyoto, all of Japan, assignors to Murakami Kaimeido Co, Shizuoka and Omuron Tateishi Electronics Co., Kyoto, both of, Japan

Filed Mar. 24, 1988, Ser. No. 173,154
Int. Cl.[4] G02B 7/18; G05B 19/10
U.S. Cl. 307—10 R 9 Claims

1. A control system for a foldable outside rearview mirror, comprising an electric motor having an electric motor circuit; an operation switch; trigger means connected with said operation switch for outputting a trigger pulse in response to actuation of said operation switch; timer means connected with said trigger means for outputting a pulse of a predetermined pulse width to drive said electric motor only for a set time upon receipt of the trigger pulse from said trigger means; polarity changing means having a pair of outputs of high and low level and formed for reversely switching said electric motor by inverting said pair of said outputs upon receipt of the trigger pulse from said trigger means; and switching means for switching a voltage applied to said electric motor to erect or fold a

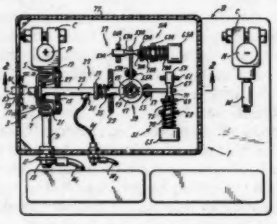


rearview mirror upon receipt of the output of said polarity changing means.

4,798,968
BATTERY DISCONNECT APPARATUS

James R. Deem, 1855 Belmont, Boise, Id. 83706

Filed May 15, 1987, Ser. No. 51,051
Int. Cl.[4] H01H 71.46
U.S. Cl. 307—10 BP 19 Claims



1. In a vehicle having an electrical circuit for supplying power from a battery on the vehicle to one or more electrical components utilized on the vehicle, apparatus for interrupting the flow of power through said circuit, said apparatus comprising:

first and second female electrical connectors connected in said electrical circuit with said electrical circuit being open between said first and second female electrical connectors;

an electrically conductive bridging element having first and second male connectors respectively mating with said first and second female electrical connectors electrically coupling said first and second female electrical connectors together when said bridging element is in an open position;

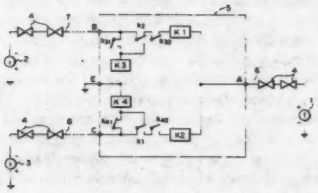
switch means for holding said oridging element in its closed position and for moving said bridging element from its closed position to its open position; and

force responsive means for triggering said switch means to move said bridging element from its closed position to its open position in response to said vehicle being subjected to extraordinary forces such as occur during a crash.

4,798,969
POWER FEED SYSTEM IN TRANSMISSION LINE BETWEEN TERMINALS OF THREE-TERMINAL STATION

Yoshiyuki Inoue, Tokyo; Masaaki Takahashi, Yokosuka; Koichi Tatekura, Hiratsuka; Hitoshi Nishikawa, Tokyo; Hajime Ohta, Tokyo, and Yoshikazu Kogure, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki; Kokusai Denshin Denwa Co., Ltd. and NEC Corporation, both of Tokyo, all of, Japan

Filed Feb. 2, 1988, Ser. No. 151,619
Claims priority, application Japan, Feb. 2, 1987, 62-020458
Int. Cl.[4] H02J 3/36; H04B 3/44
U.S. Cl. 307—112 12 Claims



1. A power feed system in a transmission line between terminals of a three-terminal station which is branched by a branching unit and has power fed between said terminals of said three-terminal station, said power feed system comprising:

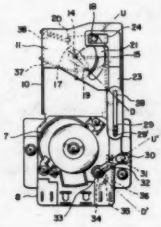
switching means for switching power on a power feed line to a repeater between a both-end power feed mode and a single-end power feed mode; and

connection holding means for holding a power feed connection state without change upon an occurrence of a failure.

4,798,970
DEFROSTING CIRCUIT SWITCH UNIT FOR ELECTRONIC RANGE

Kenzo Okamoto, Osaka, and Fumihiko Kitada, Neyagawa, both of Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1987, Ser. No. 137,211
Claims priority, application Japan, Dec. 24, 1986, 61-197345
Int. Cl.[4] H01H 43/00
U.S. Cl. 307—119 1 Claim

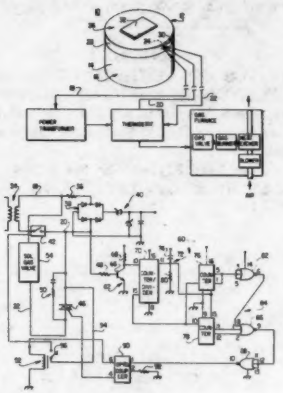


1. A defrosting circuit switch unit for an electronic range comprising: a frame of said unit, said frame being provided with a shaft; a defrosting circuit switch lever provided in a case in which a time switch is incorporated; a connecting rod having its lower end portion connected with a free end portion of said lever, said connecting rod being slidably moved up and down; a rotary plate rotatably mounted on said frame through said shaft and provided with a stopper extending in a projecting manner, said stopper being received in an elongated hole of an upper portion of said connecting rod, said rotary plate being integrally formed with a projection and a sector cam, said projection abutting on a leaf spring mounted on said frame; and a tension spring mounted between said rotary plate and said frame so as to resiliently biasing said rotary plate, said tension spring being engaged with said rotary plate through an engaging hole provided in said rotary plate.

4,798,971
APPARATUS FOR CONTROLLING DEVICE START UP AND OFF/ON RUNNING PERIODS

Charles T. Gravely, Sachse, Tex., assignor to J & S Electronics, Inc., Garland, Tex.

Filed Apr. 14, 1987, Ser. No. 38,041
Int. Cl.[4] H01H 7/00; G05F 3/04
U.S. Cl. 307—141 10 Claims



1. A control device for a system such as a forced air gas burning central heating system or the like comprising:

a. power means for producing ac voltage for operation of the system and converting ac power to dc power for a control means;

b. gate controlled semiconductor switch means connected to the power means for controlling the connection of ac power to a load; and

c. control means connected to the power means for receiving the dc power, and to the gate controlled semiconductor switch for controlling the operation of the switch means in response to the dc power, said control means including first timing means for producing an initial timing signal for the gate controlled semiconductor switch means to conduct ac power for a first preselected time, and a second timing means for producing alternately first and second timing signals for the gate controlled semiconductor switch after the initial signal to block the flow of ac power to the system for a preselected time, and to conduct ac power to the system for a preselected time, wherein the control means further includes a square wave generator connected to the ac power source for producing a plurality of square wave signals at the frequency of the ac source of power, a frequency divider connected to the square wave generator for producing square wave signals having a preselected frequency, the first timing means connected to the frequency divider for generating the initial timing signal for said first preselected time, and the second timing means includes a frequency counter means connected to the frequency divider for thereafter alternately generating said first timing signals for said preselected time periods and said second timing signals for said preselected time periods for the gate controlled semiconductor switch means.

10. A control device for regulating the combustion of gas in

a central heating system powered by an ac power source operating through a switch, comprising:

square-wave generator means connected to the ac power source for producing a plurality of square wave signals at the frequency of the ac source of power;

frequency counter/divider means for driving the power frequency into suitable clocking pulses for determining preselected timing signals;

decode counter/divider means connected to the frequency/-divider for outputting a plurality of time period indicating signals; and

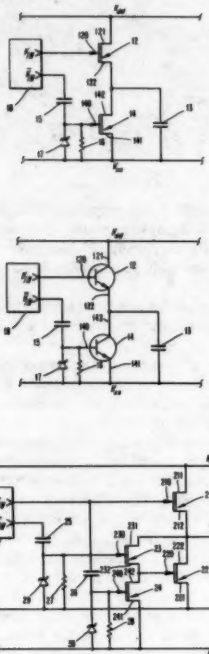
transistor means connected to the decode counter/divider for outputting timing signals to the switch, first to conduct ac power for a preselected time, and thereafter, alternately to block the working ac power for a first preselected time, and to conduct ac power for a second preselected time.

4,798,972

APPARATUS AND METHOD FOR CAPACITOR COUPLED COMPLEMENTARY BUFFERING

Ronald J. Melanson, Sunnyvale, and Jl L. Yang, Palo Alto, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 3, 1987, Ser. No. 21,251
Int. Cl.[4] H03K *17/10, 17/687, 19/003, 17/04*
U.S. Cl. 307—270 **26 Claims**



1. A semiconductor buffer circuit responsive to a digital input signal for driving a capacitive load to one of two binary states, comprising:

first transistor means having a first, second, and control electrode, the first electrode coupled to a first reference potential and the second electrode to be coupled to the capacitive load, for charging the capacitive load by current from the first reference potential through the first transistor means at times when the input signal is changing to a high level;

second transistor means having a first, second, and control electrode, the first electrode coupled to a second reference potential lower than the first reference potential and the second electrode to be coupled to the capacitive load, for discharging the capacitive load by current to the second reference potential through the second transistor means at times when the input signal is changing to a low level;

first coupling means for coupling the digital input signal to the control electrode of the first transistor means, for applying a voltage to the control electrode that increases the current between the first and second electrodes of the first transistor means at times when the input signal is changing to a high level, and decreases the current at times when the input signal is changing to a low level; and

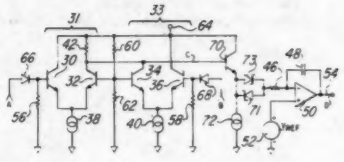
second coupling means for capacitively coupling the digital input signal to the control electrode of the second transistor means, for applying a voltage to the control electrode that decreases the current between the first and second electrodes of the second transistor means at times when the input signal is changing to a high level, and increases the current at times when the input signal is changing to a low level.

4,798,973

HIGH FREQUENCY CHARGE PUMP/INTEGRATOR CIRCUIT

John D. Morgan; William H. Gloima, both of Dallas, Tex., and Richard Boecher, Santa Clara, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 13, 1987, Ser. No. 49,632
Int. Cl.[4] H03K *3/01*
U.S. Cl. 307—296 R **12 Claims**



1. A charge pump circuit, comprising

a dropping resistor;

a current steering circuit having an output coupled to said dropping resistor and having a pair of inputs for receiving respective input signals, said current steering circuit being responsive to a first condition of said input signals for drawing no current through said dropping resistor, being responsive to a second condition of said input signals for drawing a first level of current through said dropping resistor, and being responsive to a third condition of said input signals for drawing a second level of current through said dropping resistor, wherein said second level of current is greater than said first level of current; and

an integrator circuit having an input coupled to said dropping resistor for integrating a current caused by the voltage change across said dropping resistor, said voltage change being with respect to a voltage established by said first level of current flowing through said dropping resistor.

4,798,974

INTEGRATED CIRCUIT COMPRISING A LATCH-UP PROTECTION CIRCUIT IN COMPLEMENTARY MOS-CIRCUITRY TECHNOLOGY

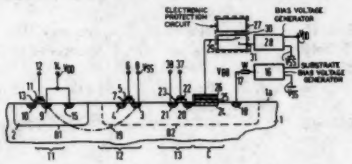
Werner Reczek, Munich, and Josef Winnerl, Landshut, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

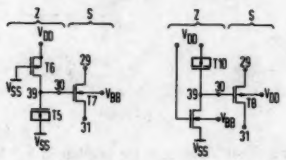
Filed Oct. 15, 1987, Ser. No. 108,630

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1987, 3700685

Int. Cl.[4] H01L *27/10*; W03L *1/00*; H03K *3/354, 3/013*

U.S. Cl. 307—296 R **15 Claims**





1. An integrated circuit, comprising:

a doped semiconductor substrate;

complementary MOS-circuitry in the substrate;

a substrate bias voltage terminal in the doped semiconductor substrate connected to an output of a substrate bias voltage generator;

a capacitor having first and second capacitor surfaces, the first capacitor surface being integrated in the doped semiconductor substrate, and the second capacitor surface being connected via an electronic protection circuit means to a capacitor bias voltage generator; and

said electronic protection circuit means interconnecting the second capacitor surface and the capacitor bias voltage generator following a delay time ΔT when the integrated circuit is switched on.

4,798,975

HIGH NOISE IMMUNITY INPUT LEVEL DETECTOR WITH HYSTERESIS

Thomas J. Walczak, Fox River Grove, and Michael P. Metroka, Algonquin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 13, 1987, Ser. No. 85,444

Int. Cl.[4] H03K *5/153*

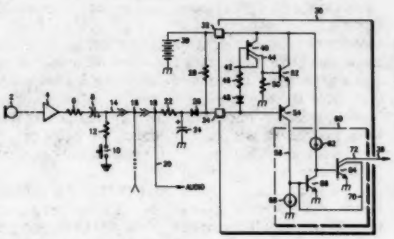
U.S. Cl. 307—350 **15 Claims**

1. In a system having an input control signal that assumes one of two states and an input information signal that makes instantaneous variations about a quiescent level, a circuit for detecting the state of the input control signal and for multiplexing the input information signal with the input control signal, comprising:

means for providing a multiplexed input signal having a control component and an information component, the control component assuming one of two levels according to the state of the input control signal and the information component varying, according to the instantaneous variations of the input information signal, about the level assumed by the control component;

threshold means for providing a threshold level which is set relative to a power supply level such that the threshold level tracks the power supply level;

comparison means for comparing the level assumed by the control component to the threshold level, including bipolar transistor means for providing a current signal indicative of the level assumed by the control signal, said comparison means having means for deterring junction breakdown in said bipolar transistor means;



standby power means for substantially reducing the operating power of said comparison means and said threshold means when the level assumed by the control component is approximately equal to said power supply level;

means, responsive to said current signal, for producing a logic output signal to indicate the status of the control component; and

means for maintaining a constant polarity, independent of the state of the input control signal, between the level of the control component and the quiescent level of the input information signal.

4,798,976

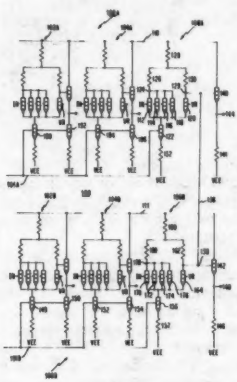
LOGIC REDUNDANCY CIRCUIT SCHEME

James J. Curtin, Fishkill; Jack A. Dorler, Holmes; George J. Jordy, Wappingers Falls, and Kenneth L. Leiner, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1987, Ser. No. 120,431

Int. Cl.[4] H03K *19/003*

U.S. Cl. 307—441 **17 Claims**



1. A redundancy circuit scheme, comprising:

a plurality of pairs of circuit groups, each circuit group having a respective circuit node and a respective power control line; said each circuit group in a given pair for generating substantially the same electrical signal on its respective circuit node as the other circuit group in the given pair generates on its respective circuit node;

a plurality of isolation circuits having respective output nodes, with a different isolation circuit connected to the circuit node for each different circuit group, said isolation circuits being powered at all times during operation, each of said isolation circuits for providing an output signal on its output node indicative of the signal on the circuit node connected thereto, while isolating said connected circuit node from nets connected to said isolation circuit output node;

means for electrically connecting together, for bidirectional communication, the circuit nodes for each pair of circuit groups, prior to the connection to the isolation circuits associated therewith;

switching means connected to each of said power control lines associated with said plurality of pairs of circuit groups for providing power to one and only one circuit group in each pair of circuit groups; and

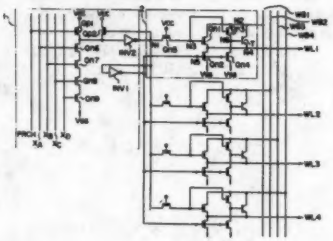
means for controlling, through said electrically connecting means, the electrical state at the isolation circuit output node of the circuit group in a given pair of circuit groups which is not powered by said switching means to have the same electrical state as the isolation circuit output node of the circuit group in the given pair of circuit groups which is powered by said switching means, so that both isolation circuit output nodes in said pair provide a correct electrical signal.

4,798,977

WORD LINE DRIVER FOR USE IN A SEMICONDUCTOR MEMORY

Koji Sakui, Tokyo, and Shigeyoshi Watanabe, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 8, 1987, Ser. No. 130,174
Claims priority, application Japan, Feb. 26, 1987, 62-41304
Int. Cl.[4] H03K *19/003, 19/01, 17/04, 4/58*
U.S. Cl. 307—446 **5 Claims**



1. An inverter comprising:

a first n-channel MOS transistor whose drain is connected to receive a potential at an "H" level, whose source is connected to an output terminal, and whose gate is used as a first input terminal;

a second n-channel MOS transistor whose drain is connected to said output terminal, whose source is connected to receive a potential at an "L" level, and whose gate is used as a second input terminal, for receiving an input signal which is complementary to an input signal supplied to said first input terminal;

an npn transistor whose collector is connected to the drain of said first n-channel MOS transistor, and whose emitter is connected to said output terminal;

a third n-channel MOS transistor whose drain is connected to the collector of said npn transistor, whose source is connected to the base of said npn transistor, and whose gate is connected to said first input terminal; and

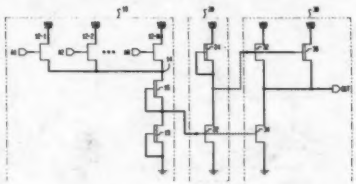
a fourth n-channel MOS transistor whose drain is connected to the base of said npn transistor, whose source is connected to receive a potential at the "L" level, and whose gate is connected to said second input terminal.

4,798,978

GAAS FET LOGIC HAVING INCREASED NOISE MARGIN

Gary M. Lee, High Bridge; Charles M. Lee, Murray Hill, and George S. LaRue, Flemington, all of N.J., assignors to Gain Electronics Corporation, Somerville, N.J.

Filed Apr. 30, 1987, Ser. No. 44,519
Int. Cl.[4] H03K *19/094*
U.S. Cl. 307—450 **12 Claims**



1. A multiple input logic gate for implementing the NOR function comprising:

an input stage including a plurality of enhancement mode FETs, said enhancement mode FETs having gate terminals for receiving logical input signals and a common source terminal, said input stage further including a depletion mode FET which is capable of level shifting the voltage present at said common source terminal, and

an inverter stage connected to said depletion mode FET, said depletion mode FET being coupled between said common source terminal and an input of said inverter stage.

4,798,979

SCHOTTKY DIODE LOGIC FOR E-MODE FET/D-MODE FET VLSI CIRCUITS

Gary M. Lee, Highbridge, N.J., and Andrzej Peczalski, Brooklyn Park, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 23, 1986, Ser. No. 910,545
Int. Cl.[4] H03K *19/017, 19/094, 19/20, 17/04*
U.S. Cl. 307—450 **15 Claims**

1. A digital logic circuit, connected to a source of electrical potential, consisting only:

an input node;

an output node;

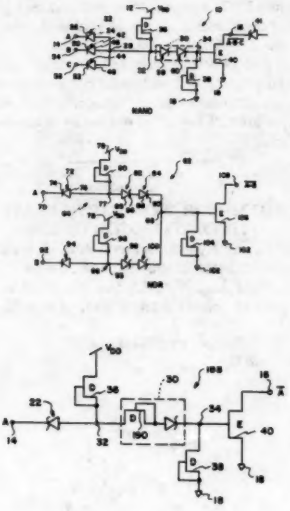
a voltage reference point;

a Schottky diode having an anode and a cathode, wherein said cathode is connected to said input node and said node is connected to a first node;

means for shifting the voltage level, wherein said means for shifting the voltage level is connected between said first node and a second node;

first and second means for drawing current, wherein said first means for drawing current is connected between said source of electrical potential and said first node, and said second means for drawing current is connected between said second node and said voltage reference point; and

means for controlling the flow of current between said output node and said voltage reference point, said means



for controlling the flow of current being connected to said second node.

4,798,980

BOOTH'S CONVERSION CIRCUIT

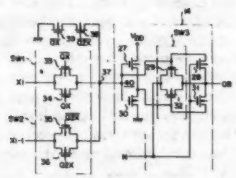
Hisashi Sugiyama; Yasuhiro Sugimoto, both of Yokohama, and Yukio Kamatani, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 13, 1987, Ser. No. 49,141

Claims priority, application Japan, Jun. 11, 1986, 61-135162

Int. Cl.[4] H03K *19/21, 19/094, 19/017*

U.S. Cl. 307—471 **6 Claims**



QX	Q2X	N	QB
0	0	0	0
1	0	0	Xi
0	1	0	Xi-1
0	0	1	1
1	0	1	$\overline{Xi}$
0	1	1	$\overline{Xi-1}$

1. A Booth's conversion circuit comprising:

a first switch circuit having an input terminal which is supplied with signal X_i of a logic level positioned in the i-digit position of a multiplicand X, and which is rendered conductive or nonconductive according to the logic level of a signal QX of logic 1 or logic 0;

a second switch circuit, having an input terminal which is supplied with signal X_{i-1} of a logic level positioned in the i-1 digit position of a multiplicand, having an output terminal which is connected to the output terminal of said first switch circuit, and which is rendered conductive or nonconductive according to the logic level of a signal Q2X of logic 1 or logic 0;

first and second transistors connected in series between the junction of said output terminals of said first and second switches and a reference potential, and which are rendered conductive or nonconductive according to the logic levels of signals QX, Q2X, the conductive and nonconductive states of said first and second switches being reversed from those of said first and second transistors; and

an exclusive logical sum circuit, having a first input terminal connected to said junction of said first and second switch circuits, and having a second input terminal supplied with a signal having a logic level 1 or 0.

4,798,981

INPUT CIRCUIT

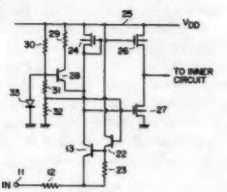
Kazunori Tsugaru, and Yasuhiro Sugimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 20, 1987, Ser. No. 28,385

Claims priority, application Japan, Mar. 31, 1986, 61-72843

Int. Cl.[4] H03K *19/097, 19/086*

U.S. Cl. 307—475 **5 Claims**



1. An input circuit driven by a single power supply for providing an output signal at a non-negative CMOS potential level to an inner circuit, comprising:

an input terminal for receiving an input signal at a negative ECL potential level;

means for providing the output signal at a non-negative CMOS potential level to the inner circuit;

a first transistor having an emitter, a collector, and a base, whose collector is coupled to the output signal providing means;

bias means coupled to the single power supply for applying a fixed bias voltage at a negative potential level to the base of said first transistor;

regulator means coupling the input terminal to the emitter of the first transistor, for regulating the amount of collector current of the first transistor; and

current-to-voltage converting means, coupling the output signal providing means and the collector of the first transistor to the single power supply, for generating the output signal at a higher non-negative potential level when the first transistor is turned off by the input signal and for generating the output signal at a lower non-negative potential level when the first transistor is turned on by the input signal.

4,798,982

ACTIVE SYMMETRICAL BALANCE HYBRID CIRCUIT

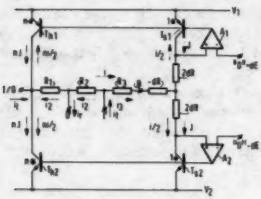
Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,226

Claims priority, application Netherlands, Sep. 15, 1986, 8602325

Int. Cl.[4] H03K 5/08

U.S. Cl. 307—490 6 Claims



1. A hybrid circuit comprising an input, an output and an in/output, at least one signal transistor, at least two auxiliary transistors for operation as current multiplexers in a circuit with an associated signal transistor and an impedance circuit incorporated in a circuit with an associated signal transistor, a junction point of the impedance circuit being connected to the output of the hybrid circuit, the impedance circuit having such an impedance related to the multiplication coefficient of the auxiliary transistor that the hybrid circuit fulfills a condition known as the line matching condition, characterized in that the impedance circuit is connected between the in/output and at least one virtual ground point of the hybrid circuit and has a further junction point connected to the input of the hybrid circuit, in that each signal transistor is connected between an associated virtual ground point and an associated supply line and in that two auxiliary transistors having the same multiplication coefficients are connected between an associated supply line and the in/output of the hybrid circuit and are incorporated in a current mirror circuit having said at least one signal transistor, with junction points in the impedance circuit determining partial impedances being selected such that a condition known as the hybrid balance condition is fulfilled.

4,798,983

DRIVING CIRCUIT FOR CASCODE BIMOS SWITCH

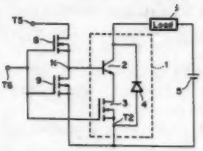
Satoshi Mori, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 21, 1987, Ser. No. 53,339

Claims priority, application Japan, Sep. 26, 1986, 61-228924

Int. Cl.[4] H03K 17/60, 5/00, 3/01, 19/02

U.S. Cl. 307—570 1 Claim



1. A driving circuit for driving a cascode type BiMOS switch including a bipolar transistor whose collector is connected through a load to a positive electrode of a power source and a field effect transistor whose drain is connected to an emitter of said bipolar transistor and whose source is connected to a negative electrode of said power source, said driving circuit comprising an n.p series body formed by connecting ann-channel field effect transistor in series relation with a p-channel field effect transistor, wherein a mid-point of said n.p series body is connected to a base of said bipolar transistor, and a drain and a source of said n-channel field effect transistor are connected to a D.C. power source and said mid-point, respectively, and a drain and a source of said p-channel field effect transistor are connected to said mid-point and said negative electrode of said power source, and a gate of said field effect transistor and gates of said n-channel and p-channel field effect transistors are connected to an input terminal, whereby said cascode type BiMOS switch is driven by a single positive or negative signal.

4,798,984

ELECTRIC MOTOR WITH EARTH PLATE PRESS FITTED TO MOTOR CASING

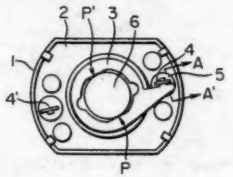
Satoshi Suzuki, and Ryoichi Someya, both of Matsudo, Japan, assignors to Mabuchi Motor Co., Ltd., Japan

Filed Aug. 20, 1987, Ser. No. 87,655

Claims priority, application Japan, Aug. 20, 1986, 61-126928[U]

Int. Cl.[4] H02K 11/00

U.S. Cl. 310—68 C 7 Claims



1. An electric motor having a motor housing comprising a large casing part with an open end supporting a small casing part, the small casing part having at the center thereof a cylindrical bearing housing protruding outwardly of the motor housing and having at the edges thereof holes through which brush holders formed with holes receiving and supporting motor terminals extend, and an earth plate comprising a base having at a central part thereof a contacting and mounting hole into which the external surface of said bearing housing is inserted as a press-fit, a neck extending from said base flush therewith, an arm extending from a free end of said neck at right angles to the plane of said neck and being inserted into at least one of the motor terminals receiving holes on one of said brush holders, and a contacting curved portion making electrical contact with at least one of said motor terminals; said earth plate being installed on said small casing part by press-fitting said base from the outside on said bearing housing and press-fitting said arm into said motor terminal receiving hole so as to make electrical contact with said motor terminal.

4,798,985

LINEAR MOTOR WITH AIR-LIFT BEARING UNLOADING

Anwar Chitayat, P.O. Box 107, Northport, N.Y. 11768

Filed Feb. 17, 1987, Ser. No. 15,680

Int. Cl.[4] H02K 5/16

U.S. Cl. 310—90 23 Claims

1. A positioning device comprising:

a stationary portion.

a movable portion;

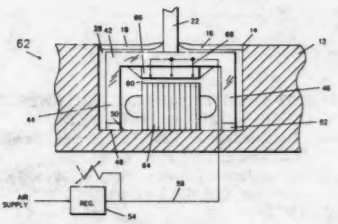
one of said stationary portion and said movable portion including a plurality of permanent magnets affixed upon a surface thereof;

the other of said stationary portion and said movable portion including an armature affixed facing said plurality of permanent magnets;

said armature including a plurality of armature coils;

said armature further including a mass of magnetically attractive material, whereby a static attractive force exists between at least some of said plurality of permanent magnets and said mass of magnetically attractive material;

at least first and second cooperating bearing means for supporting said movable portion against said static attractive force;



said first cooperating bearing means being a contact-type bearing means; and

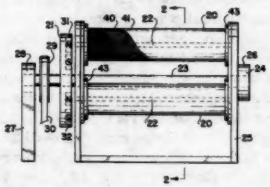
said second cooperating bearing means being of a type having a fluid forced between facing surfaces for supporting a first portion, but less than all, of said static attractive force, whereby said second cooperating bearing means is effective for supporting a remainder, less than all, of said static attractive force at all times during operation of said positioning device.

4,798,986

ELECTRIC GENERATOR HAVING STATIONARY INDUCTION COILS

Berry E. Smith, Jr., Star Rte. 1, Box 3921, Tallahassee, Fla. 32304

Filed Apr. 11, 1988, Ser. No. 180,192
Int. Cl.[4] H02K 1/22
U.S. Cl. 310—268 **16 Claims**



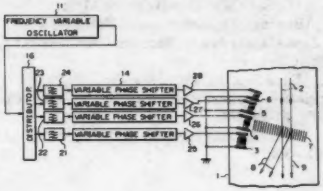
1. An electric generator including a plurality of stationary induction coils, a rotatable armature, and an elongated magnetically conductive core in each said coil; said coil comprising a plurality of turns of electrically conductive wire in a tubular shape around and closely encasing said elongated magnetically conductive core extending lengthwise through the central axis of said coil; said armature comprising a rotatable shaft and a disc structure mounted on said shaft with an even number of permanent magnets mounted circuferentially thereof in an arragement of alternating polarity with the axis of each magnet being parallel to said shaft; said coils being positioned in a spaced circumferential arrangement with one end of each coil adjacent to said disc structure and said core extending outwardly of said end to be in close proximity to said magnets, said coils being spaced apart such that any instant all of said cores are adjacently facing said magnets of the same polarity.

4,798,987

SURFACE ACOUSTIC WAVE GENERATOR

Kenji Nakamura, Hadano, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1987, Ser. No. 87,410
Claims priority, application Japan, Aug. 25, 1986, 61-197378; Aug. 25, 1986, 61-197379; Aug. 25, 1986, 61-197380
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—313 R **10 Claims**



1. A surface acoustic wave generator comprising:

a transducer array of a plurality of surface acoustic wave transducers having different center frequencies from each other;

a variable frequency oscillator for supplying an HF signal to drive said transducer array within a range which covers frequency bands of said transducers;

a distributor for distributing and inputting in parallel the HF signal supplied from said oscillator to each of said transducers of said transducer array; and

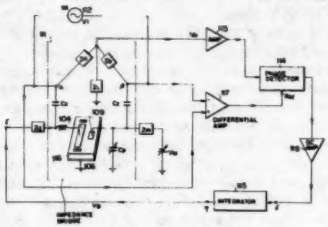
prevention means provided between each of said transducers and said distributor for preventing the HF signals reflected by said transducers from returning to said distributor.

4,798,988

OPTIMUM BIAS CIRCUIT FOR A CONVOLVER

Syuichi Mitsutsuka, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1987, Ser. No. 87,694
Claims priority, application Japan, Aug. 22, 1986, 61-196594; Sep. 2, 1986, 61-207458; Sep. 19, 1986, 61-221576
Int. Cl.[4] H01L 41/08; H03H 9/30
U.S. Cl. 310—313 R **25 Claims**



1. An optimum bias circuit for a convolver comprising:

(a) an impedance bridge which includes a plurality of fixed impedances, a reference impedance and a convolver having a gate;

(b) a first amplifier amplifying a first output from said bridge;

(c) a signal source which supplies a signal to said bridge;

(d) a second amplifier amplifying a second output from said bridge;

(e) phase detector means for detecting the phase of the

output of said first amplifier by using the output of said second amplifier as a reference signal;

(f) a DC amplifier amplifying the output of said phase detector means; and

(g) integrating means for integrating the output of said DC amplifier and for applying a signal thus obtained to said gate of said convolver.

4,798,989

SCANNING TUNNELING MICROSCOPE INSTALLED IN ELECTRON MICROSCOPE

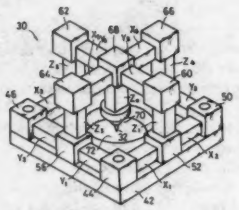
Yasumichi Miyazaki, Sagamihara, and Yasunori Koga, Isehara, both of Japan, assignors to Research Development Corporation, Tokyo, Japan

Filed Sep. 24, 1987, Ser. No. 101,233

Claims priority, application Japan, Sep. 26, 1986, 61-226285; Sep. 26, 1986, 61-226286

Int. Cl.[4] H01L *41/08*; G01N *23/00*

U.S. Cl. 310—328 **5 Claims**



1. A mechanism for moving a sample, comprising:

a sample chamber;

a sample moving mechanism;

a sample position adjusting device;

a stage accommodated in said sample chamber of a scanning electron microscope for loading a sample thereon, said stage being movable in an X–Y plane driven by said sample position adjusting device and said stage being movable in a Z direction by said sample moving mechanism which is mounted on said sample position adjusting device;

a probe located in proximity to a surface of the sample, which is loaded on said stage, for detecting a tunnel current which flows between said surface of the sample and said probe;

a probe moving mechanism for finely moving said probe in the X–Y plane which is substantially parallel to the surface of the sample and in the Z direction which is perpendicular to the X–Y plane;

an image processor for image-processing a control signal associated with said probe moving mechanism;

a region of the surface of the sample which faces a tip of said probe being irradiated by an electron beam issuing from an object lens of said scanning electron microscope;

an upper clamper provided with a pair of first piezoelectric elements which are expansible and contractible in opposite direction to each other on a line extending in the X direction, and a pair of second piezoelectric elements expansible and contractible in opposite direction to each other on a line extending in the Y direction which is perpendicular to the X direction, said upper clamper being provided with the stage for loading the sample thereon;

a lower clamper provided with third piezoelectric elements similar to said first piezoelectric elements and fourth piezoelectric elements similar to said second piezoelectric elements, said lower clamper being connected to said upper clamper by a fifth piezoelectric element which is expansible and contractible in the Z direction perpendicular to the X and Y directions;

a guide for selectively fixing in place said upper and lower clamps by expanding said first and second piezoelectric elements and said third and fourth piezoelectric elements; and

a control device for controlling a voltage which is applied to each of said first to fifth piezoelectric elements, said control device applying a different voltage to each of the first to fourth piezoelectric elements which are provided in pairs;

said guide being fixed to a base.

4,798,990

DEVICE FOR TRANSMITTING ELECTRIC ENERGY TO COMPUTERS AND DATA NETS

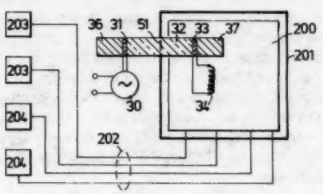
Bengt Henoch, Backvindeln 90, 126 57 Hägersten, Sweden

Filed Sep. 1, 1987, Ser. No. 91,868

Claims priority, application Sweden, Sep. 11, 1986, 8603805

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 **14 Claims**



1. A device for transmitting electric energy to electric equipment, primarily computers and data nets, which device is intended to be connected between a voltage source and the electric equipment, comprising a generator, which is intended to be connected to said voltage source and capable to generate a high-frequency mechanical wave motion and comprising a transmission member capable to transmit said motion to a receiver, which transmission member comprises a non-magnetic and electrically insulating material, in which the mechanical wave motion can be conducted, and said receiver, which is intended to be connected to the electric equipment, is capable to convert said mechanical wave motion into an electrically varying voltage, and said generator and said receiver each comprises piezo-electric element, which are in mechanical connection with said transmission member, characterized in that said transmission member (12;32;72;110;11) has the shape of a bar or corresponding continuous member, that the piezo-electric element (31;33;73) of the receiver (13;14;33-35;73-75) is connected to the first end of the transmission member while the piezo-electric element (31;71) of the generator (10;11;30;31;70;71) is connected to the other, opposed end of the transmission member, that the piezo-electric element (31;71) of the generator is capable to generate longitudinal waves in the transmission member (12;32;72;110-111), that a bar-shaped element (36;37;76;77) is located on the opposite side of each of the piezo-electric elements (31;33;71;73) relative to the transmission member, which bar-shaped elements (36;37;76;77) are capable to acoustically adapt the piezo-electric elements to the transmission number, that said electric equipment is surrounded by a shield such as a metal net or a metal wall to form a Faraday's cage around the electric equipment through which shield the transmission member runs and that said piezo-electric elements consist of a flat, round element such as a disc or ring, provided with metal coats on its opposed side surfaces which coats constitute the two poles on the receiver side which coats are not in electrical contact with the Faraday's cage.

4,798,991

SURFACE-GAP SPARK PLUG FOR INTERNAL COMBUSTION ENGINES

Walter Benedikt, Kornwestheim; Gerhard Heess, Tamm; Werner Herden, Gerlingen; Karl-Hermann Friese, Leonberg; Helmut Reum, Stuttgart; Jürgen Schmatz, Mundelsheim, and Siegbert Schwab, Sindelfingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

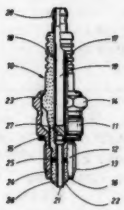
PCT No. PCT/DE86/00366, § 371 Date May 7, 1987, § 102(e) Date May 7, 1987, PCT Pub. No. WO87/01877, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 13, 1986, Ser. No. 55,891

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533124

Int. Cl.[4] H01T *13/38, 13/52*

U.S. Cl. 313—137 17 Claims



1. In a surface-gap spark plug for internal combustion engines, comprising an insulating body which has an end portion and carries a center electrode in said end portion which faces a combustion chamber side; a metal housing which partially encloses said insulating body, said metal housing carrying a ground electrode at an end thereof facing said combustion chamber side, said ground electrode annularly enclosing said center electrode at a distance therefrom, wherein an electrical field develops and a surface spark gap is formed between said center and ground electrodes along a slide path on a surface of said insulating body when voltage is applied between said electrodes, the improvement comprising said surface (22) of said insulating body (10) being shaped in such a way that it is penetrated by a plurality of lines of flux (30) of the electrical filed developing between said center and ground electrodes (16, 21), and at least a portion of one of said electrodes (16, 21) forming a cathode positioned behind said surface (22), as seen in the direction of the course of said lines of flux, with at least a constant spacing from and at a desired angle of inclination relative to said surface (22), said insulating body (10) being divided transversely and having an upper portion (23) formed of a material with relatively low dielectric constants, and lower portion (24) facing the combustion chamber side and carrying said surface and formed of a material with dielectric constants which are 5–50 times higher than that of said upper portion so as to promote a development of a surface charge on said surface.

4,798,992

COLOR CATHODE-RAY TUBE WITH ELECTRON BEAM SELECTION MASK SUPPORT STRUCTURE

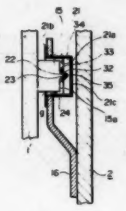
Hiroshi Ichigaya, Saitama; Susumu Tagawa, Kanagawa; Yasuoshi Sugii; Masanori Ando, both of Tokyo; Jun Yamazaki, Aichi; Yasuo Kawada, Aichi; Tokuho Kinoshita, Aichi; Toshio Shirahama, Aichi; Yoshinori Ito, Tokyo, and Eiji Munemoto, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 31,889

Claims priority, application Japan, May 14, 1986, 61-109998; Jul. 29, 1986, 61-178182

Int. Cl.[4] H02J *29/07*

U.S. Cl. 313—406 7 Claims



1. A color cathode-ray tube having an electron beam selection mask disposed through springs in a panel opposite to a color luminescent screen formed on the inner surface of said panel, said mask including an electron beam selection electrode composed of a thin metal plate with an array of electron beam transmission apertures and attached to a frame with tension, wherein positioning stud pins are fixed to said panel at points for attachment of said electron beam selection mask, and support springs to be engaged with said stud pins are anchored to said frame, each support spring having a cap engageable with the corresponding stud pin so as to cover the top of said stud pin, and a gap is formed about the entire periphery between said stud pin and the side wall of said cap, in the state of engagement.

4,798,993

ELECTRON GUN FOR ELECTRONIC TUBES

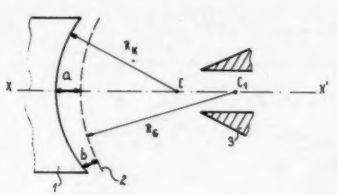
Robert Duret, Coignieres Maurepas, and Georges Fleury, Gif Sur Yvette, both of France, assignors to Thomson-C.S.F., Paris, France

Filed Mar. 6, 1985, Ser. No. 708,691

Claims priority, application France, Mar. 9, 1984, 84 03640

Int. Cl.[4] H01J *29/46*

U.S. Cl. 313—447 6 Claims



1. In an electron beam generating device for an electron tube comprising a cathode whose emissive surface is in the form of a concave spherical skull cap with an essentially uniform radius of curvature with, in the vicinity of this cathode, a modulation grid also in the form of a concave spherical skull cap which may be subjected to two different potentials for power modulating the electron beam emitted by the cathode, wherein the

distance between the cathode and the modulation grid increases the closer to the axis of the tube completely around the axis.

4,798,994

LOW REFLECTANCE DISPLAY DEVICE

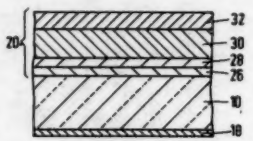
Johannes C. N. Rijpers, and Henricus M. De Vrieze, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1987, Ser. No. 93,450

Claims priority, application United Kingdom, Sep. 5, 1986, 8621468

Int. Cl.[4] H01J 29/88; G02B 1/10

U.S. Cl. 313—478 6 Claims



1. A display device having an optically transparent faceplate, an anti-reflection coating on an external surface of the faceplate, the anti-reflection coating comprising at least three layers of materials which are depositable at ambient temperature by evaporation and hardenable by subsequent annealing, said layers having been hardened by annealing, the material of one of said layers having a high refractive index with respect to that of the material of the faceplate and another one of said layers having a low refractive index with respect to that of the material of the faceplate.

4,798,995

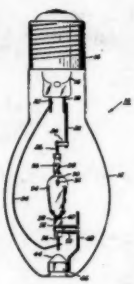
METAL HALIDE LAMP CONTAINING HALIDE COMPOSITION TO CONTROL ARC TUBE PERFORMANCE

Richard P. Gilliard, Mayfield Heights; Daniel M. Cap, Kirtland, and Timothy D. Russell, Parma, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1986, Ser. No. 915,370

Int. Cl.[4] H01J 17/20, 61/22

U.S. Cl. 313—638 8 Claims



1. A high intensity metal halide discharge lamp comprising:

an hermetically sealed vitreous light transmissive outer envelope;

first and second electrical terminal means secured into said outer envelope for making electrical connection from an external power source to the interior of said outer envelope;

first and second conductive lead means for making connection to respective ones of said terminal means;

an hermetically sealed sealed light transmissive vitreous arc tube envelope having respective first and second ends disposed within said outer envelope;

first and second electrodes comprising tungsten and thorium or thorium oxide disposed within said arc tube envelope and sealed into said first and second respective ends of said arc tube envelope;

first and second inlead means for passing through respective arc tube stems at said respective ends of said arc tube envelope and for connecting respective ones of said conductive lead means to respective ones of said first and second electrode means;

support means for supporting said arc tube envelope in a predetermined orientation relative to said outer envelope;

a discharge supporting medium disposed within said arc tube envelope and comprising a quantity of an amalgam of mercury containing 0 to 5 molar percent cadmium;

a quantity of an inert fill gas in said arc tube as a starting gas, and

a metal halide dose comprising a combination of metal halides, including thorium tetraiodide, present in said arc tube in an amount in excess of that amount vaporized during normal operation of the lamp wherein the amount of thorium tetraiodide present in the dose ranges from about 3.8 to 6.0 wt. % thereof and from about 0.9 to 1.5 milligrams per ampere of arc current to maintain a coating of thorium on at least the end portion or tip of said electrodes.

4,798,996

ELECTRONIC PHOTOFLASH CONTROL CIRCUIT

Sheir C. Lam, Tung Lung House 935, Tai Hang Tung Road, Kowloon, Hong Kong, Hong Kong

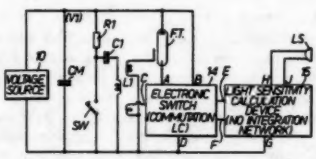
PCT No. PCT/GB84/00191, § 371 Date Jan. 16, 1985, § 102(e) Date Jan. 16, 1985, PCT Pub. No. WO84/04866, PCT Pub. Date Dec. 6, 1984

PCT Filed Jun. 1, 1984, Ser. No. 692,883

Claims priority, application United Kingdom, Jun. 1, 1983, 8315019

Int. Cl.[4] H05B 37/00

U.S. Cl. 315—241 P 13 Claims



1. A control circuit for a photoflash gun, the circuit including a flash tube, a switch means in series connection with the flash tube, a switching circuit coupled to the flash tube and the switch means for initiating operation of the flash tube and turning on the switch means to permit current flow through the flash tube, the circuit comprising:

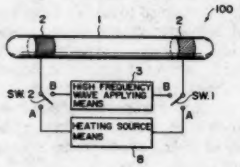
means for determining termination of the flash tube operation, the termination determining means including a resonant circuit having a capacitance and an inductance, the circuit being responsive to the initiation of the flash tube operation for causing current to flow through the inductance thereby developing a back emf, the back emf in turn producing a reverse voltage across the capacitance which is of a polarity such as to be able to reset the switch means; and

means for applying the reverse voltage at a desired time to the switch means for turning off the switch means, thereby terminating the flash tube operation.

4,798,997
LIGHTING DEVICE

Hidemi Egami, Zama; Katsuo Saito, Yokohama, and Hiroshi Satomura, Hatogaya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1986, Ser. No. 942,833
Claims priority, application Japan, Dec. 26, 1985, 60-294458; Apr. 18, 1986, 61-88318; Jul. 29, 1986, 61-176738
Int. Cl.[4] H01J 65/04; H05B 6/80
U.S. Cl. 315—115 21 Claims

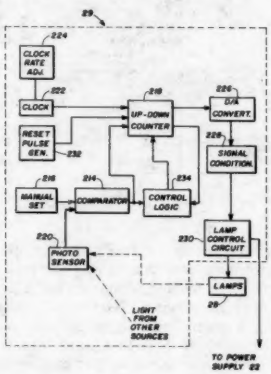


1. A lighting device comprising:
an electrodeless discharge tube adapted to emit light by a high frequency electromagnetic field being applied thereto from outside;
an electrode provided in contact with or in proximity to an outer wall of said discharge tube; and
high frequency wave applying means for applying high frequency power to said electrode, said high frequency wave applying means having means for applying to said electrode, preparatory to causing a substantially complete discharge in said discharge tube, high frequency power of lower level than that applied during the use of said lighting device, for heating said discharge tube.

4,798,998
ELECTRONICALLY DIMMED POWER LIMITED LIGHTING SYSTEM

J. Marshall Hemphill, and Roy D. Hoffer, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Dec. 15, 1986, Ser. No. 941,596
Int. Cl.[4] H05B 41/36
U.S. Cl. 315—297 8 Claims



1. A lighting system comprising:
(a) an electrical power source;
(b) at least one power supply connected to the electrical power source, said power supply containing a parallel connected power distributing means which provides electrical power to at least two separate independently operable power outputs;
(c) power limiting means connected within said power supply to individually limit the electrical power to at least two separate power output to a specific fire and/or shock hazard free predetermined value regardless of the electrical power available from the electrical power source;
(d) plural non-armored flexible cable means, each with plug and receptacle disconnect means, one end of each being connected to a power output of the power supply and a second end being connected to a gaseous discharge lighting means;
(e) the gaseous discharge lighting means operable from the limited power available from one power output of the power supply; and
(f) an electronic controller connected to the gaseous discharge lighting means and operating to control the level of its light output based upon the setting of a manual setting means connected to the electronic controller; said controller comprises;
(1) a photo sensor located to be affected by available light, including light from lamps being controlled by the lamp controller, and generating an electrical signal related to the quantity of light to which it is subjected;
(2) a manual setting means generating an electrical voltage related to the setting of a manual control;
(3) a signal comparator electrically connected to the photo sensor and to the manual setting means, receiving electrical signals from both, and generating an output of a command signal which varies with the relationship between the signals received from the photo sensor and the manual setting means;
(4) an electronic up-down counter electrically connected to the output of the signal comparator, receiving the command signal from the signal comparator, counting up or down in its register depending upon the command signal received, and generating an output signal varying with the level of the count on its register;
(5) a clock means electrically connected to the up-down counter and generating and feeding to the up-down counter a signal which repeats at a frequency determined by the clock means, the repeating signal acting upon the up-down counter to determine the rate at which the up-down counter changes the level of its count; and
(6) lamp control means; receiving electrical signals from the up-down counter and varying the electrical power applied to at least one lamp according to the level of the count of the up-down counter.

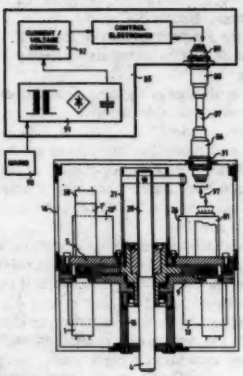
4,798,999
NUMERICALLY CONTROLLED ELECTROMECHANICAL PRECISION DRIVE SYSTEM

Jaroslaw Tecinsky, Knesebeckstr.35-37, D-1000 Berlin 12, Fed. Rep. of Germany

PCT No. PCT/DE85/00552, § 371 Date Sep. 11, 1986, § 102(e) Date Sep. 11, 1986, PCT Pub. No. WO86/04467, PCT Pub. Date Jul. 31, 1986
PCT Filed Dec. 20, 1985, Ser. No. 910,216
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501477; Dec. 13, 1985, 3544669
Int. Cl.[4] H02P 7/68
U.S. Cl. 318—45 10 Claims

1. An electromechanical precision drive means with a drive mechanism including drive shaft (4, 20) and a plurality of permanently magnetically excited, virtually inertia-free direct current motors (1, 1') with ironless armatures, wherein: each d.c. motor has a shaft with a pinion (2, 2') relatively small in diameter secured thereto; the shafts of said d.c. motors (1, 1') are parallel to said drive mechanism drive shaft (4, 20) of said drive means; said drive mechanism includes a middle gear (3) relatively large in diameter; said d.c. motors (1, 1') with their

identically designed pinions (2, 2') are equally distributed around the periphery of said middle gear (3) and said pinions engage said middle gear (3); said d.c. motors comprise a circular arrangement of a first group of motors (1) kept to one side of said middle gear (3) and a circulat arrangement of an equal sized second group of motors (1') kept to the other, opposite side of said middle gear (3); the two groups of motors (1, 1') are



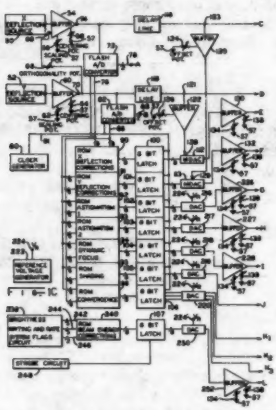
in staggered relation to each other such that one pinion (2) each of the first group lies between two pinions (2') of the second group of motors and vice versa; an independent voltage supply is provided for each d.c. motor enabling each d.c. motor (1, 1') to constitute a separately controlled and monitored autonomous motor unit; and means synchronously control all d.c. motors independently of each other.

4,799,000

DISPLAY CONTROL APPARATUS

Ernest F. Close, Fort Wayne, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Sep. 30, 1986, Ser. No. 913,768
Int. Cl.[4] H01J *29/56*
U.S. Cl. 315—371 **15 Claims**



1. Display control apparatus for use with a CRT having an electron gun beam and an electron beam activated screen, x and y analog signal sources for providing, respectively, horizontal and vertical deflection of the electron beam, and having at least one CRT display control member, that improvement comprising:

memory means for storing and addressing digital data;

first analog to digital converter means coupled between the x analog signal source and said memory means for converting the x analog deflection signal to a corresponding x digital deflection signal;

second analog to digital converter means coupled between the y analog signal source and said memory means for converting the y analog deflection signal to a corresponding y digital deflection signal;

sampling means coupled to said first and said second analog to digital converter means for simultaneously sampling each of the x and y digital signals, whereby an x, y digital sample set is provided from said first and said second analog to digital converter means; each of said sample sets corresponding to a respective predetermined point location on the screen; said point locations being spaced one from another over a predetermined portion of the entire viewed area of said screen;

said memory means for storing digital data relating to at least one CRT display control member for each of said digital sample sets; said memory means for using said x, y digital sample sets to address said digital data;

digital to analog converter means coupled to said memory means for converting said addressed digital data to corresponding analog signals;

coupling means for coupling said digital to analog converter means to the display control member;

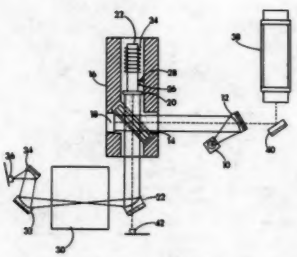
whereby each of said digital sample sets provides an address for respective digital data in said memory means to provide real time geometrically corrected analog signals to the display control member.

4,799,001

START OF SCAN CIRCUIT FOR FTIR SPECTROMETER

Robert V. Burch, Madison, Wis., assignor to Nicolet Corporation, Madison, Wis.

Filed Jul. 23, 1987, Ser. No. 76,916
Int. Cl.[4] G01B *9/02*
U.S. Cl. 318—640 **12 Claims**



1. A start of scan circuit for an FTIR spectrometer which includes an interferometer with a moving mirror, a positioning laser also directed into the interferometer, and a laser detector for detecting in-phase pulses of laser light exiting from the interferometer and generating a digital output signal, the start of scan circuit connected through a servo circuit to control motion of the moving mirror, the start of scan circuit comprising:

a mode counter having a series of output lines which are clocked through a series of states, each state corresponding to a state of motion of the moving mirror, the mode counter output lines connected to the servo circuit to control the moving mirror motion;

a position counter circuit controllable selectively (i) to load a preselected numerical value into a position counter and (ii) to increment or decrement the numerical value therein;

physical position sensor means for detecting a position of the mirror; and

gating means for connecting the output lines of the mode counter selectively (i) to gate the digital output signal of the laser detector to the position counter to increment or decrement the numerical value therein and (ii) to actuate the position counter to load said preselected numerical value, the gating means also for connecting the output of the position counter to the input of the mode counter, the gating means is also connected so that the position counter sequentially: (1) is loaded with a value when the physical position sensor means detects the position, the value representing a distance the mirror is moved beyond the physical position sensor means; (2) counts until the mirror moves the distance; (3) counts a distance the mirror retreats as it is stopped; (4) counts back the distance the mirror retreated as it stopped; (5) is loaded with a value representing a distance until the start of scan; and (6) counts until the distance is reached.

4,799,002

METHOD OF DRIVING A FIVE-PHASE STEPPING MOTOR

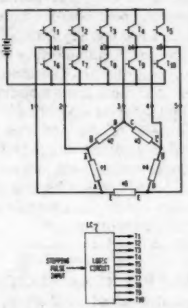
Kenji Matsumoto, Kashiwa, Japan, assignor to Oriental Motor Co, Ltd., Tokyo, Japan

Filed May 15, 1987, Ser. No. 50,937

Claims priority, application Japan, May 20, 1986, 61-76152[U]

Int. Cl.⁴ H02P 8/00

U.S. Cl. 318—696 **6 Claims**



1. A method of driving a five-phase stepping motor having phase windings connected in series with each other to form a ring and junctions between the phase windings connected to connections between pairs of switching means, wherein one of the pair of switching means is connected to a positive pole of a d.c. power source and the other of the pair of switching means to a negative pole of the power source, comprising the steps of:

connecting two of said junctions to the positive pole of the power source with respective ones of said switching means, connecting two others of said junctions to the negative pole of the power source with respective others of said switching means, setting both switching means of remaining pairs to an off condition so that the junctions of said pairs are disconnected from the source, and switching the switching means in said pairs so that the disconnected junctions of one pair shifts to other junctions in response to every pulse and so as to energize all phase windings before and after the switching of said switching means.

4,799,003

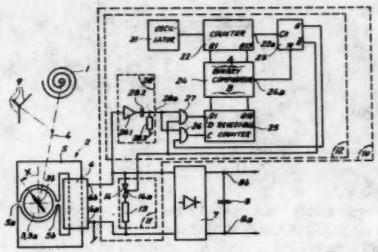
MECHANICAL-TO-ELECTRICAL ENERGY CONVERTER

Xuan M. Tu, Rue de la Blancherie 34, CH-1022 Chavannes, and Dabo Taghezout, Rue du Tombet 20, CH-2034 Peseux, both of Switzerland

Filed May 28, 1987, Ser. No. 55,196

Int. Cl.⁴ H02D 9/04

U.S. Cl. 322—29 **11 Claims**



1. A mechanical-to-electrical energy converter comprising:

an electrical energy generator having a rotor and means for generating said electrical energy in response to rotation of said rotor;

means for storing at least temporarily said electrical energy;

a mechanical energy source connected mechanically to the rotor and able to generate a mechanical driving torque for driving said rotor at a first speed greater than a predetermined set speed;

means for generating a periodic reference signal having a period equal to the ratio between a predetermined angle of rotation of said rotor and said set speed;

means for generating a control signal having first and second states including means for putting said control signal into one of said states at each one of a plurality of first periodic instants having a period equal to that of said reference signal, means for generating a comparison signal between the real position of said rotor at each first instant and the position the rotor would be in if it were to rotate at said set speed, and means for putting said control signal into the other of said states in response to said comparison signal; and

means for electrically braking said rotor responsive to said first state of the control signal for subjecting said rotor to a braking torque opposed to said mechanical driving torque and imposing on said rotor a second speed lower on average than said set speed, and responsive to said second state of the control signal for stopping the application to the rotor of said braking torque.

4,799,004

TRANSFER CIRCUIT FOR OPERATION TEST OF LSI SYSTEMS

Shojiro Mori, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 25, 1988, Ser. No. 148,385

Claims priority, application Japan, Jan. 26, 1987, 62-15816

Int. Cl.⁴ G01R 15/12

U.S. Cl. 324—73 R **9 Claims**

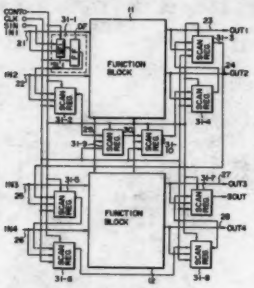
1. A transfer circuit for the operation test of an LSI system comprising:

mode setting means for selectively setting a first or second operation mode;

a plurality of first shift register means connected to function blocks of said LSI system and each including a plurality of scan registers which are connected to input terminals of a corresponding one of the function blocks to respectively latch input data of the corresponding function block in the

first operation mode and which are serially connected to shift the contents in the second operation mode;

a plurality of second shift register means connected to the function blocks of said LSI system and each including a plurality of scan registers which are connected to output terminals of a corresponding one of the function blocks to



respectively latch output data of the corresponding function block in the first operation mode and which are serially connected to shift the contents in the second operation mode; and

serial transfer means for serially connecting said first and second shift register means to constitute a shift register circuit.

4,799,005

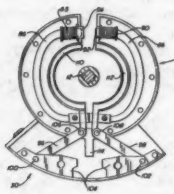
ELECTRICAL POWER LINE PARAMETER MEASUREMENT APPARATUS AND SYSTEMS, INCLUDING COMPACT, LINE-MOUNTED MODULES

Roosevelt A. Fernandes, 104 Ruby Rd., Liverpool, N.Y. 13088

Division of Ser. No. 859,497, May 5, 1986, Pat. No. 4,709,339, which is a continuation-in-part of Ser. No. 484,681, Apr. 13, 1983, Pat. No. 4,689,752. This application May 11, 1987, Ser. No. 48,579

Int. Cl.[4] G01R *21/133, 21/00*

U.S. Cl. 324—127 **13 Claims**



1. A sensor module for hot-stick mounting on and removal from an energized, high voltage power conductor volts, said module comprising, in combination:

(a) a first, generally cylindrical housing portion having a central axis and a metallic skin, and containing at least one electrical element responsive to the electromagnetic field associated with said energized conductor mounted within said first housing portion, said metallic skin being divided by an insulating member along at least one, complete, peripheral path to prevent an electrical short circuit loop extending entirely around said element, allowing said electromagnetic field to be coupled to said element;

(b) hot-stick mounting means and removal including hinge members for mounting said module upon said conductor with the latter extending along said central axis of said cylindrical housing portion and conductivity isolated from said metallic skin to sense voltage of said power conductor; and

(c) a second housing portion affixed to the exterior of said first housing portion and extending about said central axis thereof not more than about 150°, said second housing portion containing said hinge members.

4,799,006

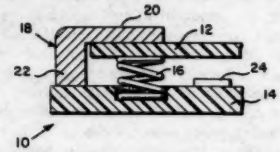
ATE TEST FIXTURE HAVING A SELF-SEALING VACUUM SKIRT

Heinz F. Strohschneider, deceased, late of Plymouth, Mass. (Strohschneider; Waltraud B., legal representative), assignor to Augat Inc., Mansfield, Mass.

Filed Jun. 11, 1987, Ser. No. 62,501

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—158 F **9 Claims**



1. An automatic testing equipment test fixture having a self-sealing vacuum skirt for testing an electronic circuit device to be tested, comprising:

an electronic circuit device to be tested receiving face having a circumferential edge, a first rim close to the edge and confronting the electronic circuit device to be tested, and a second rim close to the edge that opposes the first rim;

a probe support board having a circumferential edge, and a first rim close to the edge and confronting the electronic circuit device to be tested receiving face;

means coupled between said face and said board for supporting said face and said board in spaced-apart relation that defines an open peripheral interface between said face and said board for relative movement reciprocally along an axis generally parallel to a perpendicular of said face and said board; and

a free-standing resilient skirt having a first portion for sealing with the first rim of the electronic circuit device receiving face and a second portion for sealing with at least the first rim of the probe support board, which said first and said second portions are integrally formed with said skirt and extend about the peripheral interface defined between said face and said board, the first portion for sealing with the first rim ofthe electronic circuit device receiving face being a lip that seats against and is supported by the confronting surface of the first rim but does not seat against nor seal said second rim of said receiving face, the second portion for sealing with at least the first rim of the probe support board being a lip that seats against and is supported by the confronting surface of at least the first rim of said probe support board.

4,799,007

BENDABLE PIN BOARD TEST FIXTURE

Stephen J. Cook, and Michael L. Bullock, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 794,198, Nov. 1, 1985, abandoned. This application Jul. 14, 1987, Ser. No. 73,876

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—158 F **15 Claims**

1. A board test fixture for interfacing electronic signals from a card having electronic devices mounted thereon at fixed predetermined locations, to test system interface having electrical contacts at fixed predetermined locations, the electronic devices including ends to be matched with, and electrically connected to the contacts, regardless of the disposition or alignment of the contacts relative to the ends of the electronic devices to be tested, the fixture comprising:

a perforate probe plate disposed intermediate the card and the test system interface and having a first plurality of spaced-apart holes at fixed predetermined locations thereon, said first plurality of holes being aligned in substantial registration with the ends of the electronic devices on the card;

said probe plate further including a second plurality of

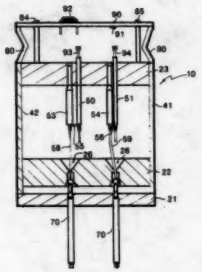
spaced-apart holes at fixed predetermined locations thereon, said second plurality of holes being aligned in substantial registration with the electrical contacts of the test system interface;

said probe plate additionally including a third plurality of spaced-apart holes at fixed predetermined locations thereon, said third plurality of holes being axially offset relative to the electrical contacts of the test system interface;

each one of said second and third plurality of holes being generally disposed adjacent to, and substantially grouped with a corresponding one of said first plurality of holes;

probing means disposed partly within said first plurality of holes in said probe plate, and partly intermediate the card and said probe plate, in substantial alignment with corresponding ones of the ends of the electronic devices, for selectively establishing electrical contact therewith during the test;

interconnecting means connected to said probe plate, and engaging said second plurality of holes on said probe plate, adjacent said probing means, in substantial alignment with corresponding ones of the contacts, for establishing electrical connection therewith;



said interconnecting means further engaging said third plurality of holes on said probe plate, when said corresponding adjacent ones of said probing means are in substantial alignment with the oppositely positioned contacts on the test system interface;

electrical conducting means, connected between said generally adjacent probing means and interconnecting means, for providing a continuous electrical path therebetween;

said electrical conducting means being physically dimensioned to offset the separation between said probing means and said interconnecting means, for causing the ends of the electronic devices to be matched with, and electrically connected to corresponding ones of the contacts of the test system interface; and

actuating means for moving the card relative to said probe plate, for causing the ends of the electronic devices on the card to contact said probing means, in order to establish a continuous electrical path between the electronic devices and the test system interface.

4,799,008

AC LEVEL CALIBRATION APPARATUS

Shigeru Kannari, Gyoda, Japan, assignor to Advantest Corporation, Gyoda, Japan

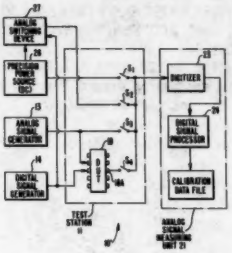
Filed Apr. 7, 1987, Ser. No. 35,391
Claims priority, application Japan, Apr. 14, 1986, 61-86255
Int. Cl.[4] G01R *31/28, 35/00*
U.S. Cl. 324—73 R **5 Claims**

1. An analog test system, comprising:

a DC power source for generating a DC reference voltage;

a digital signal generator for generating an alternating control signal which is a first level signal for a first time period, and a second level signal for a second time period;

an analog switching device, coupled to an output of said DC power source and an output of said digital signal generator, for interrupting the flow of the reference voltage based on the alternating control signal generated by said digital signal generator and for changing the reference voltage into an AC level calibration signal waveform;



a waveform digitizer, coupled to said analog switching device, for converting the AC level calibration signal into a digital data signal;

digital signal processing means, coupled to said waveform digitizer, for obtaining reference values from the digital data signal;

comparing means for comparing said reference values from the digital data signal with predetermined reference values and for obtaining an AC level error; and

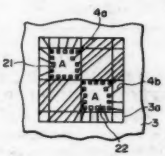
compensating means for calibrating for said AC level error.

4,799,009

SEMICONDUCTOR TESTING DEVICE

Tetsuo Tada, and Keisuke Okada, both of Hyogo, Japan, assignors to VLSI Technology Research Association, Kanagawa, Japan

Continuation of Ser. No. 200,354, Oct. 24, 1980, abandoned.
This application Mar. 31, 1983, Ser. No. 479,117
Claims priority, application Japan, Oct. 25, 1979, 54-139156
Int. Cl.[4] G01R *1/06, 31/02*
U.S. Cl. 324—158 P **2 Claims**



1. A semi-conductor testing device comprising a prober adapted to receive a wafer to be tested, a probe card coupled to said prober, said probe card having a single rectangular window through which four identical semi-conductor chips on said wafer may be observed simultaneously, a first set of probes having free contact ends being mounted along two adjacent sides of said window with said free contact ends being disposed in a contact pattern adjacent one corner of said rectangular window and a second set of probes having free contact ends being mounted along the remaining two sides of said rectangular window with said free contact ends being disposed in an identical contact pattern adjacent a corner of said rectangular window diagonally opposite the first mentioned corner wherein said probes in each set are adapted to be connected to

a common set of lead wires whereby two semi-conductor chips can be tested simultaneously.

4,799,010

PROCESS FOR DETECTING DEFECTS ON A SURFACE BY EDDY CURRENTS AND DEVICE FOR CARRYING OUT SAID PROCESS

Jean-Louis Muller, Le Vesinet, France, assignor to Institut de Recherches de la Siderurgie Francaise, Maizieres-Les-Metz, France

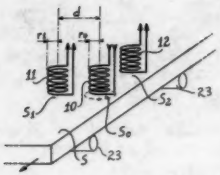
PCT No. PCT/FR85/00258, § 371 Date May 20, 1986, § 102(e) Date May 20, 1986, PCT Pub. No. WO86/01896, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 20, 1985, Ser. No. 876,854

Claims priority, application France, Sep. 20, 1984, 84 14435

Int. Cl.[4] G01N *27/90*

U.S. Cl. 324—240 **9 Claims**



1. A device for detecting defects having a general orientation on a surface of a semi-finished metallic product, said device comprising:

an emitter situated close to the surface of the product to be examined for generating a magnetic field to cause eddy currents to be generated within a predetermined region of said surface;

a receiver separate from said emitter and close to the surface of the product such that the receiver is aligned with the emitter in a direction corresponding to the general orientation of the defects to be detected on said surface, said receiver being spaced from said emitter so as to be outside the predetermined region and not affected by the eddy currents generated by the magnetic field produced by the emitter when the surface of the product is defect-free, and producing a significant signal when a defect in the surface of the product causes a deviation of the eddy currents in the direction of the receiver; and

means for providing relative movement between said surface and said emitter and receiver.

4,799,011

PROCESS AND DEVICE FOR DETECTING STRUCTURAL DEFECTS IN A PRODUCT UTILIZING DIFFERENTIAL DETECTION OF EDDY CURRENTS

Jean-Louis Muller, Le Vesinet, France, assignor to Institut de Recherches de la Siderurgie Francaise-IRSID, Maizieres-les-Metz, France

PCT No. PCT/FR85/00248, § 371 Date May 20, 1986, § 102(e) Date May 20, 1986, PCT Pub. No. WO86/01895, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 17, 1985, Ser. No. 879,111

Claims priority, application France, Sep. 20, 1984, 84 14434

Int. Cl.[4] G01N *27/82, 27/90*; G01R *33/12*

U.S. Cl. 324—233 **6 Claims**

3. A device for detecting, by eddy currents, typical defects on a surface of a product, particularly for the detection of cracks on a slab, said device comprising:

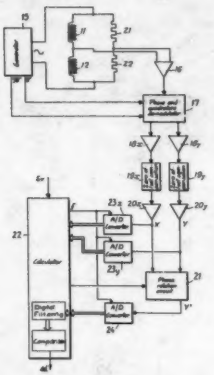
means for generating at least one alternating magnetic field to cause eddy currents to be produced on the surface of the product;

a first detector positioned in facing relationship with the surface of the product for generating a first signal representative of the eddy currents detected in a portion of the surface facing said first detector;

a second detector positioned in facing relationship with the surface of the product for generating a second signal representative of the eddy currents detected in a portion of said surface facing the second detector, said first and second detectors being spaced from each other in a direction of relative movement between said product and said detectors;

differential signal generating means for receiving said first and second signals and generating a differential signal representative of the difference between said first and second signals;

demodulating means for receiving said differential signal from said differential signal generating means and demodulating said differential signal, forming a demodulated differential signal;



calculating means connected to an output of said demodulating means for receiving said demodulated differential signal and automatically and periodically determining a phase angle at which a component of the demodulated signal relative to said phase angle has a minimum mean value;

providing and converting means for continuously providing the component of the demodulated signal at said periodically determined phase angle and converting same into a digital signal;

digital filter means having characterisucs predetermined as a function of a type of defect to be detected for receiving and filtering said digital signal to form a filtered digital signal; and

comparator means connected to an output of said digital filter means for generating a defect detection signal when the value of the filtered digital signal exceeds a predetermined threshold value.

4,799,012

MAGNETIC RESONANCE IMAGING SYSTEM

Masatoshi Hanawa, Ootawara, Japan, assignor to Kabushiki Kaishi Toshiba, Kawasaki, Japan

Filed Feb. 1, 1988, Ser. No. 151,210

Claims priority, application Japan, Feb. 2, 1987, 62-23160

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **6 Claims**

1. A magnetic resonance imaging system comprising:

static magnetic field generating means for generating a static magnetic field to be applied to an object to be examined;

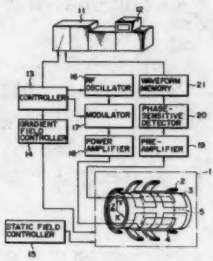
gradient field applying means for applying a predetermined

gradient field to the object to be examined so as to be superposed on the static magnetic field;

high-frequency pulse applying means for applying a high-frequency pulse having a predetermined frequency and a predetermined frequency band to the object to be examined, the high-frequency pulse including a $\pi/2$ pulse;

detecting means for detecting a magnetic resonance signal from the object to be examined;

control means for controlling each of said static magnetic field generating means, said gradient field applying means, said high-frequency pulse applying means, and said detecting means in accordance with a predetermined sequence to cause the object to be examined to generate magnetic



resonance and to cause said detecting means to detect the magnetic resonance signal; and

data processing means for processing data based on the magnetic resonance signal detected by said detecting means to obtain image information,

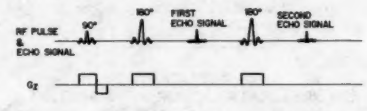
wherein said control means includes local excitation control means for selectively exciting at least a pair of legions sandwiching a predetermined region to be examined including a portion of interest of the object to be examined by applying predetermined gradient fields having different polarities substantially simultaneously when a $\pi/2$ pulse is applied, erasing a transverse magnetization component of the adjacent regions, and then exciting the region to be examined.

4,799,013

METHOD FOR DETECTING AND PROCESSING MAGNETIC RESONANCE SIGNALS

Masahiko Hatanaka, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 21, 1988, Ser. No. 147,157
Claims priority, application Japan, Jan. 26, 1987, 62-15727
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—312 **6 Claims**



1. A method for detecting and precessing magnetic resonance signals generated by applying a static magnetic field and RF pulse to a subject, the method comprising the steps of:

detecting a plurality of magnetic resonance echo signals by providing a plurality of different phase encoding data to the magnetic resonance echo signals;

correcting the amplitudes and phases of the magnetic resonance echo signals provided with the different phase encoding data, by using magnetic resonance echo signals when phase encoding data is 0; and

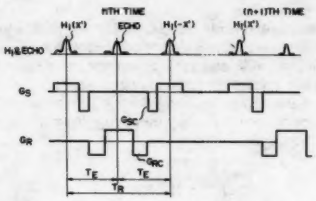
performing Fourier transform on the magnetic resonance echo signals whose amplitudes and phases have been corrected.

4,799,014

METHOD OF SETTING CONDITIONS OF HIGH-FREQUENCY MAGNETIC FIELD

Kazuto Nakabayashi, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 11, 1987, Ser. No. 131,433
Claims priority, application Japan, Dec. 15, 1986, 61-296567
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—314 **5 Claims**



1. A method of setting the intensity of a high-frequency magnetic field in order to adjust and set a field intensity of the high-frequency magnetic field in a magnetic resonance imaging system, comprising the steps of:

(a) sequentially changing the amplitude of an excitation high-frequency magnetic field pulse,

(b) repeatedly performing magnetic resonance excitation and reading of a magnetic resonance signal, and

(c) utilizing as a reference in setting the intensity of the high-frequency magnetic field the amplitude of the high-frequency magnetic field pulse, which corresponds to one of the maximum and minimum values of the magnetic resonance signal obtained by a plurality of excitation cycles, and

(d) applying an opposite phase high-frequency magnetic field pulse, having the same amplitude as that of the excitation high-frequency magnetic field pulse, and having a carrier wave which is 180° out of phase with respect to that of the excitation high-frequency magnetic field pulse, to an object after reading of the magnetic resonance signal is completed and before the next excitation cycle started.

4,799,015

METHOD OF MAPPING THE NUCLEAR MAGNETIC PROPERTIES OF AN OBJECT TO BE EXAMINED

Raimo Sepponen, Helsinki, Finland, assignor to Instrumentarium Corp., Finland

Continuation of Ser. No. 794,485, Nov. 4, 1985, abandoned. This application Jul. 7, 1987, Ser. No. 70,658
Claims priority, application Finland, Nov. 21, 1984, 844561
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—314 **24 Claims**

1. A method for mapping the local distribution of the dependence of the relaxation time $T_{1\rho}$ of nuclei of a selected element in an object on the strength of a locking field B_1, termed the B_1-dispersion of the relaxation time $T_{1\rho}$, said nuclei having magnetic properties, said method comprising the steps of:

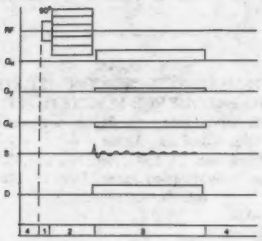
applying a main magnetic field B_0 to the nuclei of the area of the object being examined;

subjecting the object to an excitation pulse which tilts the magnetization of the nuclei from the direction of the main field B_0;

applying a locking pulse B_1 of given magnitude to the object, said locking pulse having a magnetic component with a constant phase difference with respect to the tilted magnetization of the nuclei and under which the relaxation process characterized by the relaxation time $T_{1\rho}$ occurs;

applying a suitable magnetic resonance imaging method for obtaining relaxation time $T_{1\rho}$ data; and

repeating the foregoing steps with different magnitudes of the locking pulse B_1 for obtaining B_1-dispersion of the relaxation time $T_{1\rho}$ data.



4,799,016

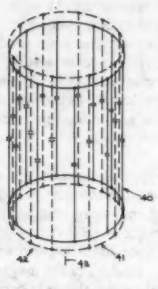
DUAL FREQUENCY NMR SURFACE COIL

Behrooz Rezvani, Shorewood, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Jul. 31, 1987, Ser. No. 80,038

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **5 Claims**



1. A dual frequency NMR radio-frequency (RF) coil comprising:

a first cylindrical cage coil having a first pair of conductive loop elements disposed in a spaced-apart relation along a central axis, and a plurality of first conductive segments electrically interconnecting the first conductive loop elements at points spaced along the periphery of each of said first conductive loop elements, and the first conductive segments include reactive elements which have values that cause the first cylindrical cage coil to resonate at a lower RF frequency; and

a second cylindrical cage coil which is electrically insulated from said first cylindrical cage coil, and having a second pair of conductive loop elements disposed in a spaced-apart relation along the central axis, and a plurality of second conductive elements electrically interconnecting the second conductive loop elements at points spaced along the periphery of each of said second conductive loop elements, and the second conductive segments include reactive elements which have values that cause the second cylindrical cage coil to resonate at a higher RF frequency.

4,799,017

BACKGROUND FIELD MAGNET FOR IMAGE GENERATING DEVICES USING NUCLEAR SPIN RESONANCE

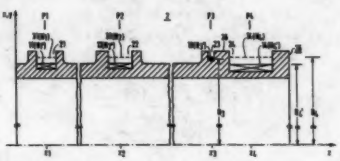
Horst Siebold, Erlangen, and Franz Strakwald, Ebermannstadt, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 24,814

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609226

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—319 **11 Claims**



1. A background field magnet for image generating devices using nuclear spin resonance comprising:

a. a coil support with a longitudinal axis; and

b. one of a first and second set of primary coils, wherein:

i. said first set of primary coils comprises at least a first, second and third primary coil pair disposed on said coil support, each coil pair comprising two coils, the coils of said first, second and third primary coil pair being symmetrically at a respective first, second and third distance from a plane of symmetry perpendicular to said longitudinal axis on said coil support, said coil pairs having a first preselected set of corresponding ampere-turns (N1, N2, N4), and cross-sections, said first set of primary coils producing a first homogenous field of a first intensity in response to a first current; and

ii. said second set of primary coils comprises at least a first, second, third and an additional primary coil pair disposed on said coil support, each coil pair comprising two coils, the coils of said first, second, third and additional primary coil pairs being disposed symmetrically at a respective first, second, third and fourth distance from said plane of symmetry, said first, second and third distances being substantially equal to the distances of the first, second and third coil pairs of said first set, respectively, to said plane of symmetry, said coil pairs of the second set having a second preselected set of corresponding ampere-turns (N1', N2', N4' and N3'), and cross-sections, said second set of primary coils producing a second homogenous field of a second intensity lower than said first intensity in response to a second current.

4,799,018

AIR FUEL RATIO MEASURING SYSTEM

Norio Ichikawa, Mito; Takayuki Itsuji, and Masayuki Miki, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuta, both of, Japan

Filed Aug. 11, 1987, Ser. No. 84,077

Claims priority, application Japan, Aug. 27, 1986, 61-198890

Int. Cl.[4] G01N *27/62, 27/66*

U.S. Cl. 324—465 **10 Claims**

1. In an air fuel ratio measuring system that measures the air fuel ratio of fuel gas burned to produce an exhaust gas and that provides an output signal Vo that varies continuously corre-

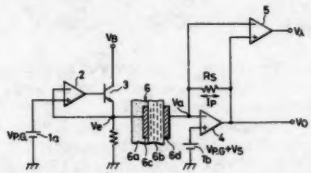
sponding to the air fuel ratio over all of the rich, stoichiometric and lean air fuel ratios, said system having a detecting element having a solid oxygen ion electrolyte, a reference electrode and a detecting electrode on the opposite sides of the electrolyte, respectively, a diffusion layer controlling a quantity of oxygen molecules arriving at the detecting electrode, and driving circuit means for impressing an interpole voltage between said electrodes so as to pump oxygen ions in one of two directions to detect a pump current between the electrodes, wherein the improvement is in said driving circuit comprising:

first source means generating a constant potential ground reference voltage $V_{P.G.}$;

first control means connected to said detecting electrode for controlling the voltage of said detecting electrode to approach $V_{P.G.}$, when the pump current is varied;

second source means generating a constant second reference voltage equal to the sum of said $V_{P.G.}$ and an applied voltage V_s;

second control means connected to said reference electrode for controlling the voltage of said reference electrode to approach said second reference voltage ($V_{P.G.}+V_s$) so



that the interpole voltage between the electrodes of said detecting element is controlled to said applied voltage V_s and said second control means generating the output signal Vo that varies continouusly and is correlated to the air fuel ratio changes throughout lean stoichiometric and rich air fuel ratios;

first detecting means connected between said reference electrode and the output signal of said second control means for detecting the pump current corresponding to the air fuel ratio and outputting a continuous detecting signal that varies continuously and changes in sign from rich to lean air fuel ratios at the stoichiometric value; and

second detecting means connected to said first detecting means to receive said detecting signal for detecting the sign change of the pump current and outputting a step signal VA that changes in correlation to a change in pump current sign, whereby said continuous output signal V_O is delivered from said second control means and the step signal is delivered from the second detecting means over the full range of lean, stoichiometric and rich air fuel ratios.

4,799,019

ELECTRICAL CONTINUITY LOAD MONITORING CIRCUIT

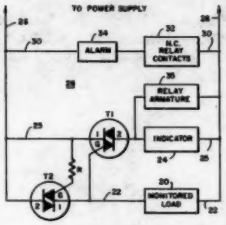
Charles Cooley, 8766 Timber Point, San Antonio, Tex. 78250, and William Fenton, Jr., 70 Springwood Rd., South Portland, Me. 04106

Filed Mar. 2, 1987, Ser. No. 20,873
Int. Cl.[4] G08B *21/00*; G01R *31/02*
U.S. Cl. 324—546 **16 Claims**

1. An improved electrical continuity load monitoring circuit for monitoring an AC electrical load coupled in a first electrical line including electrical indicating means in a second electrical line coupled in parallel with the first electrical line and load for monitoring the load comprising:

first AC electronic switch means comprising first and second electrode terminals coupled in series with the indicating means in the second electrical line, said first AC electronic switch means also comprising a gate terminal coupled to the first electrical line for delivering gate current and voltage to the first AC electronic switch means so that the first AC electronic switch means is conducting through the first and second electrode terminals in series with the indicating means when there is electrical continuity through the load and power is being supplied to the load and indicating means thereby actuating the indicator means in the second electrical line for indicating that power is supplied to the load with electrical continuity through the load;

reactance control means coupled in series with the load in the first electrical line for adjusting the phase angle of gate



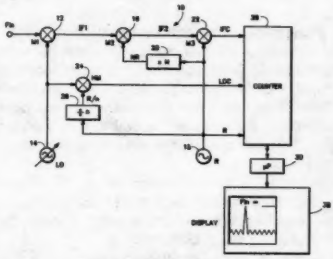
current to voltage delivered to the first electronic switch means for turn on of the first electronic switch means said reactance control means comprising a second AC electronic switch means having first and second electrode terminals coupled in series with the electrical load in the first electrical line and a gate terminal, resistance means operatively coupling the gate terminal to the second electrical line so that the second AC electronic switch means is conducting through the first and second electrode terminals in series with the load when power is being supplied to the load and indicating means and the first electronic switch means is conducting.

4,799,020

TIME VARIANT FREQUENCY CORRECTION TECHNIQUE

James D. English, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 6, 1987, Ser. No. 12,096
Int. Cl.[4] G01R *23/14*
U.S. Cl. 324—79 R **2 Claims**



1. An instrument for measuring the frequency of an input signal, the instrument having a variable local oscillator and a reference oscillator, comprising:

means for deriving an intermediate frequency from the input signal frequency, the frequency of the local oscillator and the frequency of the reference oscillator;

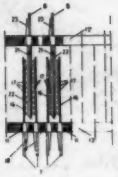
means for deriving an adjusted local oscillator frequency from the frequency of the local oscillator and the frequency of the reference oscillator; and means gated by the frequency of the reference oscillator for simultaneously counting the intermediate frequency and the adjusted local oscillator frequency, the frequency of the input signal being a function of the intermediate frequency and the adjusted local oscillator frequency.

4,799,021

METHOD AND APPARATUS FOR TESTING EPROM TYPE SEMICONDUCTOR DEVICES DURING BURN-IN

Lucio Cozzi, Agrate Brianza, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy

Filed Jul. 15, 1987, Ser. No. 73,654
Claims priority, application Italy, Jul. 22, 1986, 83633 A/86
Int. Cl.[4] G01R *1/04, 31/00*
U.S. Cl. 324—73 R **6 Claims**



1. An apparatus for functional testing and for determining the characteristics of EPROM type semiconductor devices during a burn-in heat treatment, comprising means for erasing the EPROM by U.V. light irradiation of the devices, means for programming the EPROMs means for verifying the programming of the EPROMs means for performing the burn-in of the programmed devices, means for verifying the retention of the programmed data, means for measuring parametric (DC) and dynamic (TAC) characteristics of the devices and means for classifying and handling the single devices,

characterized by the fact that it comprises essentially:

(a) at least a burn-in chamber provided, on at least a wall thereof, with a plurality of slots having automatic closing means and capable of receiving a card;

(b) a plurality of cards for mounting the devices to be tested, each card comprising a first part provided with a plurality of sockets, connected in parallel for plugging in the devices and a second part containing a microprocessor, a coupling body fitting into said slots being present between said first part and second part of the card, said second part of the cards remaining outside said chamber upon insertion of the card into one of said slots;

(c) a plurality of cards containing at least one U.V. lamp, each of said cards comprising a first part provided with at least one U.V. lamp and a second part containing switching and supply means for said lamp, a coupling body suitably fitting into said slots being present between said two parts of the card, the second part of the card remaining outside said chamber upon insertion of the card into one of said slots;

(d) a system's central processing unit (CPU) interfaced with the microprocessor of each of said cards for mounting the devices and with the switching means of each of said cards containing at least a U.V. lamp;

each of said U.V. lamps containing cards being functionally interposed between two cards of devices;

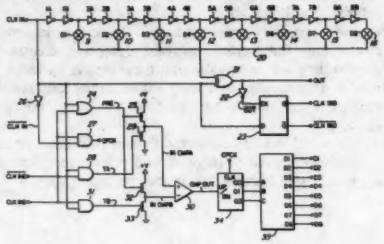
said microprocessors determining the performance of the following operations upon the devices: programming, verification of the programming, verification of retention of programmed data, classification of devices in terms of quality and identification of the devices under control of the system's central processing unit which coordinates the switching of said U.V. lamps for erasing operations.

4,799,022

FREQUENCY DOUBLER WITH DUTY CYCLE MONITOR MEANS

Simon J. Skierszkan, Nepean, Canada, assignor to Mitel Corporation, Canada

Filed Oct. 13, 1987, Ser. No. 108,264
Claims priority, application Canada, Nov. 7, 1986, 522,500
Int. Cl.[4] H03B *19/10, 5/20*
U.S. Cl. 328—20 **14 Claims**



1. A frequency doubler for receiving an input clock signal of predetermined frequency and generating an output signal at twice said frequency, comprised of:

(a) delay line means for receiving and delaying said input clock signal by a predetermined amount,

(b) an EXCLUSIVE OR gate having first and second inputs for receiving said input clock signal and said delayed input clock signal respectively, and generating said output signal at twice said predetermined frequency in response thereto, and

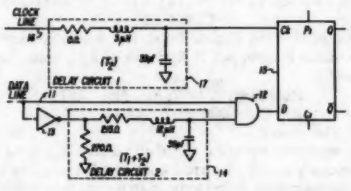
(c) control means for monitoring the duty cycle of said output signal and in the event said duty cycle is greater than fifty percent adjusting said delay line means to decrease said predetermined amount of delay, and in the event said duty cycle is less than fifty percent adjusting said delay line means to increase said predetermined amount of delay, whereby said output signal duty cycle is maintained at fifty percent.

4,799,023

CIRCUITS AND APPARATUS WHICH ENABLE ELIMINATION OF SETUP TIME AND HOLD TIME TESTING ERRORS

Kamran Firooz; Vance R. Harwood; Robert C. Illick, Jr., and David T. Crook, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 318,529, Nov. 5, 1981, abandoned. This application Jul. 5, 1985, Ser. No. 753,366
Int. Cl.[4] H03K *5/22*; G01R *15/12*
U.S. Cl. 328—110 **6 Claims**



1. A circuit for use in a circuit tester, said circuit comprising:

a first input on which a data signal is to be applied;

a second input on which a detection signal is to be applied, said detection signal indicating the times at which detection of said data signal is initiated;

coincidence means, connected to the first and second inputs and responsive to the data signal and the detection signal, for detecting whether a time at which detection of the data signal is initiated occurs within a hold time prior to the initiation of a transition of the data signal or a setup time subsequent to the initiation of a transition of the data signal;

said setup time being the length of the interval immediately succeeding the initiation of a transition in the data signal in which accurate detection of the data signal cannot be made if the detection is initiated within that interval and said hold time being the length of the interval immediately succeeding the initiation of detection of the data signal in which accurate detection of the data signal cannot be made if the data signal makes a subsequent transition in thes hold time interval;

wherein each time at which said data signal is to be detected is indicated by a trigger edge in the detection signal and wherein said coincidence means comprises:

means, responsive to the data signal, for producing a first signal having at each transition of the data signal a pulse of duration equal to the sum of the setup and hold times; and

means for producing from the detection signal a delayed detection signal which has trigger edges delayed by a fixed amount relative to the trigger edges in the detection signal, said fixed amount of delay being selected so that a trigger edge of the delayed detection signal occurs during one of the pulses if and only if a trigger edge of the detection signal occurs within a setup time after a transition in the data signal or within a hold time begore a transition in the data signal; and

means, responsive to said first signal and responsive to the delayed detection signal, for detecting whether a trigger edge in the delayed detection signal occurs during one of the pulses in the first signal.

4,799,024

CIRCUIT ARRANGEMENT TO MONITOR THE TIME SPACING OF SIGNALS

Helmut Fischer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 636,756, Aug. 1, 1984, abandoned. This application Mar. 3, 1987, Ser. No. 21,598

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329242

Int. Cl.[4] H03K 5/22, 5/153

U.S. Cl. 328—110 **25 Claims**

1. A circuit arrangement to monitor the time spacing of first and second square-wave input signals exhibiting respective first and second levels, wherein said second square-wave input signal exhibits said first level when said first square-wave input signal exhibits said second level, said circuit arrangement including switch means responsive to said first square-wave and coupled between a constant current source and ground and including a capacitor coupled to said constant current source such that said capacitor is respectively not charged and charged by said constant current source responsive to said first square-wave input signal exhibiting said respective first level and said first square-wave input signal exhibiting a transition from said respective first level to said respective second level, the circuit arrangement further comprising:

a switching stage for generating a first threshold value and a second threshold value representative of the beginning and end, respectively, of an expectancy period or time interval of an expected level of the second square wave input signal;

a comparator having an output, having a first input coupled to an output of the switching stage, and having a second input coupled to said capacitor for comparing the generated threshold values with the charge level of said capacitor and for generating at said output of said comparator a signal representative of said comparing; and

an output stage, coupled to receive the output of said comparator and said second square wave input signal, for generating an output signal when said second square wave input signal exhibits said first level during the expectancy period.

4,799,025

DIGITAL FM DEMODULATOR USING DIGITAL QUADRATURE FILTER

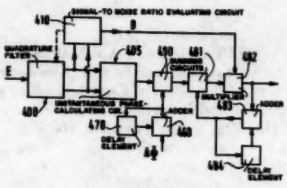
Marcel Le Quéau, Ozoir-La-Ferriere, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 876,323, Jun. 19, 1986, abandoned. This application Sep. 21, 1987, Ser. No. 102,812

Claims priority, application France, Jun. 21, 1985, 85 09491

Int. Cl.[4] H03K 9/06

U.S. Cl. 329—107 **5 Claims**



1. A frequency modulated digital signal demodulator comprising a digital quadrature filter comprising an odd number of n delay elements arranged in cascade, each delaying an input signal sample X by a value $T_E = 1/F_E$, where F_E is the sample frequency of the input signal samples, a plurality of multipliers each multiplying its input signal by a given coefficient C, and means for connecting said multipliers with said delay elements to a first and a second summing circuit, such that the output signal S_{31} of the first summing circuit equalizes:

$\Sigma C_{n-1} X_{i+1}$, where i=1,,3,5 . . . n and the output signal S_{32} of the second summing circuit equalizes:

$\Sigma C_i X_{i+1}$, where i=0,2,4, . . . n−1 X_{n+1} being the sample present at the filter input and X_{n+1-i} being the sample being delayed i.T_E, the demodulator comprising at the outputs of the first and second summing circuits a circuit for calculating the instantaneous phase ϕ_n of successive signal samples, and a circuit for evaluating the signal to noise ratio, which is connected to a control circuit supplying a control signal for modifying the coefficients of the quadrature filter such that its passband is narrowed when said ratio drops below a given threshold.

4,799,026

MULTIFUNCTION AMPLIFIER

Steven B. La Barge, and Leon J. Stanger, both of Grass Valley, Calif., assignors to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Sep. 16, 1987, Ser. No. 97,249

Int. Cl.[4] H03F 3/45

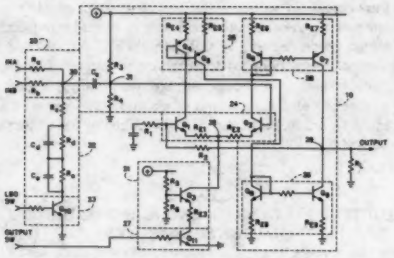
U.S. Cl. 330—254 **7 Claims**

1. A multifunction amplifier comprising:

a finite transconductance amplifier having a high input impedance and a desired output impedance, the desired output impedance being a function of an input resistor, a feedback

resistor and a finite transconductance for the finite transconductance amplifier; and

means for controlling the finite transconductance amplifier by turning on and off a current source supplying current



bias for the finite transconductance amplifier such that when turned off the finite transconductance amplifier has an essentially infinite output impedance and when turned on has the desired output impedance.

4,799,027

LOW-FREQUENCY AMPLIFIER

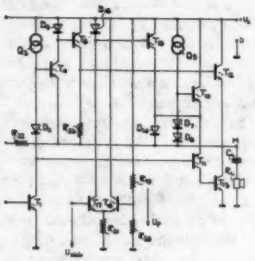
Johann Mattfeld, Obersulm, and Joachim Sinderhauf, Kochersteinsfeld, both of Fed. Rep. of Germany, assignors to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Oct. 1, 1987, Ser. No. 103,405

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633415

Int. Cl.[4] H03F *3/30*

U.S. Cl. 330—267 **11 Claims**



6. A low-frequency amplifier for use with a power source which provides a supply voltage, comprising:

a transistorized push-pull class B final stage which receives power from the power source;

means for setting the quiescent current through the final stage at a predetermined small value of the means employing circuitry which requires a supply voltage of more than a predetermined voltage value for operation;

further means for setting the quiescent current through the final stage at another value which is larger than the predetermined small value, the further means being selectively actuatable and employing circuitry which does not require a supply voltage of more than the predetermined voltage value for operation; and

switchover means, responsive to the supply voltage, for actuating the further means when the supply voltage is too low for operation of the means.

4,799,028

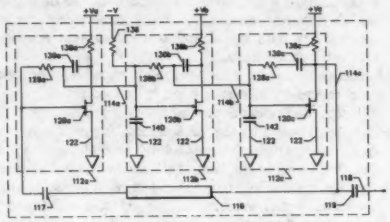
ZERO PHASE SHIFT ACTIVE MICROWAVE OSCILLATORS WITH RESISTIVE FEEDBACK IN FIELD EFFECT TRANSISTOR AMPLIFIERS

Gary R. Weaver, Manhattan Beach; Bryce M. Smith, Los Angeles; Gregory L. Horvath, Mountain View, and Bernard L. Walsh, Jr., Northridge, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 2, 1986, Ser. No. 881,438

Int. Cl.[4] H03B *5/20*

U.S. Cl. 331—57 **20 Claims**



1. An oscillator circuit which receives power from a power source comprising:

a plurality of amplifier stages, at least one of the stages having its own phase shift at a selected oscillating frequency, the plurality of amplifier stages being coupled in series, at least one of the plurality of stages comprising:

at least one active component means for providing amplification, the at least one component means having an input and an output,

a resistive feedback path for providing negative feedback and phase shifting between the input and the output of the at least one component means,

means coupled to the output of the at least one component means for filtering noise and for introducing additional phase shifting of the at least active component means,

means coupled between the output of the at least one component means and the input of another stage of the plurality of amplifier stages for blocking DC voltages between the plurality of stages, and

means coupled between the power source and the input and the output of the at least one component means for biasing the at least one component means into an operating range of the at least one component means; and

transmission delay element means coupled with at least one of the plurality of amplifier stages for providing a second phase shift such that the total loop phase shift of the oscillator circuit is equal to zero at the oscillating frequency.

4,799,029

SAW OSCILLATOR WITH ATTENUATOR FOR PROTECTING SAW ELEMENT

Shinzoo Minomo, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 848,962, Apr. 7, 1986, abandoned. This application Nov. 19, 1987, Ser. No. 124,335

Claims priority, application Japan, Jun. 29, 1985, 60-143757

Int. Cl.[4] H03B *5/30*

U.S. Cl. 331—107 A **2 Claims**

1. An oscillator comprising:

an amplifier means with an input and an output, said amplifier means exciting an oscillation and producing an output signal at its output;

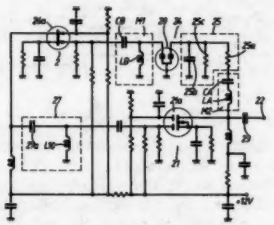
a feedback path for feeding back said output signal of said oscillation exciting amplifier means to its input, said feedback path including:

an inductor and an attenuator connected in series to the output of said amplifier for attenuating the level of said

output signal and for shifting the phase of said output signal by 180°;

a surface acoustic wave filter connected to receive the phase shifted output signal from said attenuator and inductor;

a second inductor connected between the output of said surface acoustic wave filter and ground for phase compensation of the original output from said surface acoustic wave filter;



a buffer amplifier means connected between the output of said surface acoustic wave filter and the input of said oscillation exciting amplifier means; and

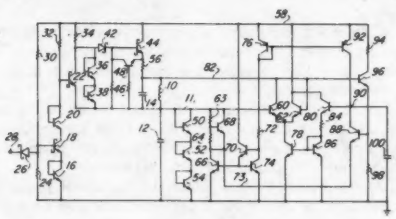
a third inductor connected on one end to the output of said buffer amplifier means and on the other end to ground, wherein said buffer amplifier and said third inductor act to again shift the phase of said phase shifted output signal by 180°.

4,799,030

VOLTAGE CONTROLLED OSCILLATOR CLAMP CIRCUIT

Michael H. Haight, Plano, and William H. Giolma, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 12, 1987, Ser. No. 49,187
Int. Cl.[4] H03B 5/08
U.S. Cl. 331—117 R **12 Claims**



1. An oscillator circuit having a tank coil and capacitor, comprising:

a clamping resistor coupled to an alternating voltage end of said tank;

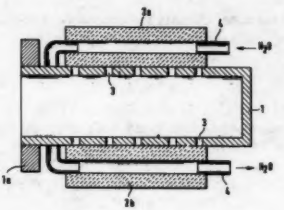
a clamp switch coupled between said clamping resistor and a source of high voltage operative in response to a first logic clamp input signal to close and shunt said coil with said clamping resistor so as to stop the oscillation and, in response to removal of said logic clamp signal, to open and permit oscillation to resume, wherein the coil current established when said clamp switch is closed is approximately equal to the peak tank current for the unclamped state, and wherein said clamp switch includes a transistor having an emitter connected to an alternating voltage end of said clamping resistor, means for biasing a d. c. end of said coil at a selected substantially fixed voltage above ground, means for biasing a base of said transistor at a selected voltage above said d. c. end of said coil in response to the logic clamp input signal.

4,799,031

WAVEGUIDE DEVICE FOR PRODUCING ABSORPTION OR ATTENUATION

Manfred Lang, Taufkirchen, and Walter Höppler, Munich, both of Fed. Rep. of Germany, assignors to Spinner GmbH, Elektrotechnische Fabrik, Munich, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,841
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641086
Int. Cl.[4] H01P 1/22, 1/26
U.S. Cl. 333—22 R **18 Claims**



1. A waveguide device for producing absorption or attenuation; comprising:

a waveguide section defining an axis and having an interior; and

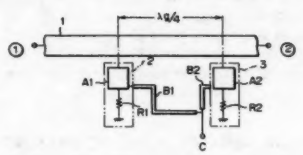
absorbing means arranged externally along said waveguide section for absorbing or attenuating a wave propagating in said waveguide section in a direction of progation along said axis, said waveguide section being provided with a plurality of apertures for coupling said absorbing means with said interior, said apertures being spaced successively along the direction of wave propagation and being of a shape and dimension so that the wave is allowed to penetrate said absorbing means and a same amount of power is coupled out through each of said apertures.

4,799,032

DIRECTIONAL COUPLER

Hideo Sugawara, Otawara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 12, 1987, Ser. No. 84,190
Claims priority, application Japan, Aug. 12, 1986, 61-189083
Int. Cl.[4] H01P 3/08
U.S. Cl. 333—116 **9 Claims**



1. A directional coupler comprising:

a main line formed by a microstrip line;

a first series circuit including a first conductive pad and a first resistor connected in series, said first resistor having open end connected to the ground;

a second series circuit including a second conductive pad and a second resistor connected in series, said second resistor having one end connected to ground, said first

conductive pad and said second conductive pad being placed adjacent to said main line so as to realize a desired loose coupling between said main line and said first or second conductive pads, and said first conductive pad and said second conductive pad being separated by a distance equal to λg/4, where λg is the wavelength of the signal supplied to said main line;

a first conductive pattern having a first end connected to said first conductive pad, having a second end, and having a width narrower than the width of said main line;

a second conductive pattern having a first end connected to said second conductive pad, having a second end and having a width narrower than the width of said main line, said first conductive pattern having a length different by λg/4 from the length of said second conductive pattern; and

an output terminal directly connected to the second ends of said first and second conductive patterns.

4,799,033

MICROWAVE SEPARATOR

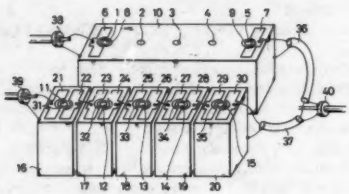
Sadao Igarashi, and Moriaki Ueno, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 19, 1987, Ser. No. 27,788

Claims priority, application Japan, Aug. 7, 1986, 61-185868

Int. Cl.[4] H01P *5/12*

U.S. Cl. 333—134 **1 Claim**



1. In a microwave separator of the type having a first band pass filter connected between a signal input terminal and one end of a first coaxial cable for filtering a lower frequency band of an input microwave signal, a second band pass filter connected between a signal output terminal and one end of a second coaxial cable for filtering a higher frequency band of the input microwave signal, wherein the other ends of the first and second coaxial cables are connected in parallel to a common signal input/output source,

the improvement comprising

said first band pass filter being of the comb type having a plurality of inner conductors formed in a line through a dielectric block; and

said second band pass filter being of the coaxial type in which a plurality of coaxial type resonators are connected to one another in series through respective capacitances.

4,799,034

VARACTOR TUNABLE COUPLED TRANSMISSION LINE BAND REJECT FILTER

Lawrence H. Silverman, Dix Hills; Randy Teague, Syosset, and Richard Kaminsky, Dix Hills, all of N.Y., assignors to General Instrument Corporation, New York, N.Y.

Filed Oct. 26, 1987, Ser. No. 112,285

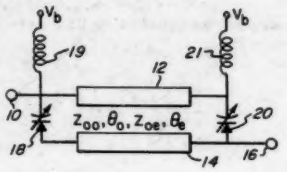
Int. Cl.[4] H01P *1/203, 1/20*

U.S. Cl. 333—202 **9 Claims**

1. A tunable coupled transmission line band reject filter for use in the microwave frequency range comprising:

a coupled transmission line having first and second line sections, each line section having an input end and an output end, said transmission line exhibiting a natural notch at a particular frequency;

a first varactor coupled between the input ends of said first and second sections;



a second varactor coupled between the output ends of said first and second sections; and

means for biasing said first and second varactors to change the capacitance thereof, thereby changing the frequency at which said natural notch occurs.

4,799,035

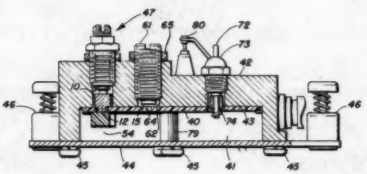
MICROWAVE DIODE TUNING CIRCUIT

Ronald L. Chilluffo, Coral Springs, and Ellis J. Gottlieb, Palm Beach, both of Fla., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Nov. 6, 1987, Ser. No. 117,597

Int. Cl.[4] H01P *7/08, 3/08*

U.S. Cl. 333—223 **13 Claims**



1. A tuner for combining a microwave diode, a variable inductor and a variable capacitor into a resonant circuit, the impedance of which is matched to the impedance of a microwave transmission line, comprising

a microstrip transmission line including an insulating substrate, a conductive circuit track on one surface of said substrate and a ground plane on the surface of said substrate opposite said one surface thereof;

a microwave diode holder of coaxial form including an outer conductor, a center conductor and a sleeve extending partially over the length of said center conductor and supporting said center conductor axially within said outer conductor, said outer conductor being conductively connected to said ground plane,

said sleeve being conductively connected to said center conductor and said outer conductor and being longitudinally adjustable along the length of said center conductor;

a microwave diode having anode and cathode electrodes, one of said electrodes being conductively connected to that end of said center conductor within said outer conductor and extending beyond said sleeve;

impedance matching means having an impedance value intermediate between the impedance value of said diode and the characteristic impedance value of said circuit track for conductively connecting the other electrode of said diode to said circuit track; and

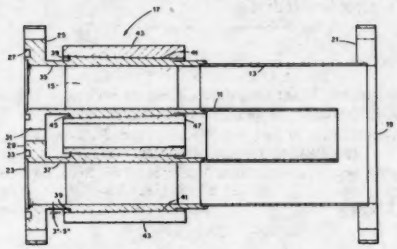
an adjustable capacitor connected between said ground plane and said circuit track at a point on said circuit track beyond said impedance matching means.

4,799,036

RADIO FREQUENCY COAXIAL FEEDTHROUGH

Thomas L. Owens, Kingston, Tenn., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Dec. 7, 1987, Ser. No. 129,209
Int. Cl.[4] H01P 1/08, 5/00
U.S. Cl. 333—260 5 Claims



1. A radio frequency coaxial transmission line feedthrough device for transmitting radio frequency energy between first and second coaxial transmission line regions of different pressure, comprising:

a coaxial transmission line segment having an inner cylindrical conductor formed of an electrically conductive material and an outer cylindrical conductor formed of an electrically conductive material and coaxially disposed about and spaced from said inner conductor, said coaxial transmission line segment being adapted for connection between said first and second coaxial transmission line regions;

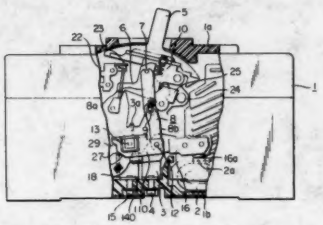
a least one pressure barrier means for sealably isolating said first and second coaxial transmission line regions and providing transmission of said radio frequency energy therethrough, including an annular right circular cylinder barrier disk formed of a rigid, impermeable, electrically insulating material coaxially disposed between and contiguous with said inner and outer conductors of said segment along the length thereof; a first radial force transmitting collar disposed about and contiguous with the outer surface of said outer conductor in axial alignment with said barrier disk; a sleeve formed of a material having a coefficient of expansion equal to or less than said barrier disk disposed about said first radial force transmitting collar to continually generate a radially inward force sufficient to form a gas-tight seal between the inner surface of said outer conductor and the outer diameter surface of said barrier disk; a second radial force transmitting collar disposed within and contiguous with the inner surface of said inner conductor in axial alignment with said barrier disk and a plug formed of a material having a coefficient of expansion equal to or greater than said barrier disk disposed within said second radial force transmitting collar to continually generate a radially outward force sufficient to form a gas-tight seal between the outer surface of said inner conductor and the inner diameter surface of said barrier disk, said first and second radial force transmitting collars having an axial thickness less than that of said barrier disk of an amount sufficient to prevent deformation of the radii of said outer and inner conductors at the edges of said barrier disk from the application of said inner and outer radial forces transmitted through said first and second radial force transmitting collars to the walls of said outer and inner conductors, respectively.

4,799,037

CIRCUIT INTERRUPTER

Tsukasa Iio; Yoshinori Mochizuki; Hiroshi Fujii; Yasusi Genba, and Hideaki Moriwaki, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 4, 1987, Ser. No. 92,944
Claims priority, application Japan, Sep. 9, 1986, 61-138777[U]
Int. Cl.[4] H01H 75/00
U.S. Cl. 335—46 1 Claim



1. A circuit interrupter comprising in a housing:

a movable contact assembly having a movable contact carrier and a contact arm supporting said movable contacat carrier;

a cross bar secured to said movable contact assembly allowing said movable contact assembly to rotate therewith; and

a bearing assembly secured to the housing and rotatably supporting said cross bar, said bearing assembly having a stop surface capable of being engaged by said movable contact assembly and determining the OFF position of said movable contact assembly.

4,799,038

SNAP-ACTION HEAT RESPONSIVE DEVICE

Shigeru Tabei, Tokyo, Japan, assignor to Tobu Electric Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1987, Ser. No. 68,076
Claims priority, application Japan, Jul. 4, 1986, 61-157532
Int. Cl.[4] H01H 61/06
U.S. Cl. 337—379 33 Claims

2. A snap-action temperature response device comprising a bimetallic strip, said bimetallic strip having a sprung unactuated state in which the metallic strip is bent over on itself to form a bent portion and two elongated leg portions extending from said bent portion, each of said leg portions having engaging means which are spaced from one another when said bimetallic strip is in said sprung unactuated state, and a stretch in said space between each of said engaging means of said two leg portions, said stretcher having pivot-support means engaging and pivotably supporting said engaging means of each of said leg portions, said leg portions being pivotal at said pivot-support means from said sprung unactuated state to a sprung actuated state in response to a temperature change of said bimetallic strip.

4,799,039

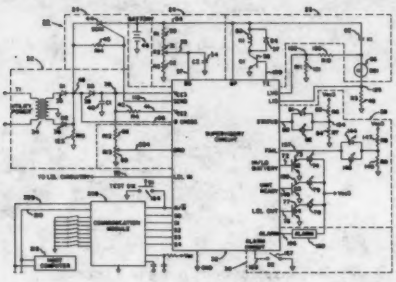
EMERGENCY LIGHTING SUPERVISORY SYSTEM

James E. Balcom, Newtown, Conn.; Edward P. Kozek, Beaconsfield, Canada, and Arnold N. Alderman, San Jose, Calif., assignors to Dual-Lite Manufacturing, Naguabo, P.R.

Continuation of Ser. No. 696,262, Jan. 30, 1985, abandoned. This application May 8, 1987, Ser. No. 48,530

Int. Cl.[4] G08B *29/00*

U.S. Cl. 340—333 70 Claims



1. An emergency lighting supervisory system for entering emergency mode operation that causes at least one emergency lamp to be energized from emergency battery power upon sensing an emergency condition such as utility power failure comprising:

A. a battery for providing emergency power:

B. a battery charger for maintaining the battery in a fully charged state; the battery charger comprising means for providing a constant current charging of the battery upon system installation or after the battery has provided emergency power, thereafter providing an equalization voltage to the battery having a value greater than the nominal charging voltage presented to the battery, wherein this equalization voltage is provided for a set period of time, and thereafter providing a float voltage having a value equal to the nominal charging voltage to the battery, such charging continuing until a transfer to emergency battery power is needed;

C. at least one lamp to be illuminated by the battery when emergency power is provided;

D. means, interconnected to the utility power, the battery and the lamp, for sensing the utility power voltage and for initiating the transfer from utility power to battery emergency power when utility power is not present, when the utility power voltage falls below a threshold value, or when self-testing of the emergency lighting system is performed;

E. means for performing periodic self-testing of emergency lighting supervisory system parameters, said means including

1. timer generating means including means for generating outputs which occur on a multi-day basis,

2. self-test control means responsive to said timing output for initiating a self-test for a period of time, said means including means for activating the transfer means so as to place the system in a simulated emergency operating mode, and

3. means for monitoring and displaying the status of system parameters when the self-test condition is activated, including means for determining current flow through the lamp so as to ascertain if the lamp is operating properly, said current flow means including means for visually annunciating the determination of an improperly operating lamp, means for determining if a battery induced voltage is applied to the lamp so as to determine if transfer of battery power has occurred, said applied voltage determining means including means for visually annunciating the determination of improper transfer of battery power to the lamp, and means for determining if the battery voltage is below a predetermined level indicative of a faulty battery condition, said battery voltage determining means including means for visually annunciating the determination of a faulty battery condition; and

F. communication means for transfer of the status of the system parameters from the self-test procedure to an interconnected device as well as to provide for initiation of a self-test procedure upon receipt of a request from an interconnected device.

4,799,040

DATA CONVERSION CIRCUIT

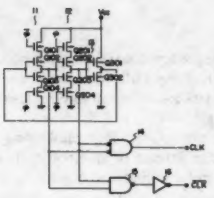
Hisao Yanagi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 594,124, Mar. 28, 1984. This application Jan. 30, 1987, Ser. No. 9,567

Claims priority, application Japan, Mar. 30, 1983, 58-54465

Int. Cl.[4] H03K *13/24*

U.S. Cl. 341—101 5 Claims



1. A data conversion circuit for performing conversion between serial and parallel data comprising:

a plurality of flip-flop series having master/slave flip-flops, the number of said master/slave flip-flops equal to the number of bits of said parallel data, said flip-flops having terminals for serial data and parallel data, respectively, and said flip-flops being divided into predetermined plural numbers of groups to respectively form said plurality of flip-flop series; and

a clock signal generator circuit for generating clock signals, the phase number of said clock signals equal to the number of said plurality of flip-flop series and the respective phases of said clock signals not overlapping each other in phase, said clock signal generator circuit rendering to operate at the leading edge of said clock signals a master flip-flop and a slave flip-flop of the master/slave flip-flop contained in each of said flip-flop series, and also rendering said flip-flop series to operate in synchronization with each other;

in which said flip-flop series are made operative upon said clock signals thereby to perform a data conversion between said serial and parallel data.

4,799,041

RECIRCULATING ANALOG TO DIGITAL CONVERTER WITH AUTO-CALIBRATING FEATURE

James E. Layton, Ochelata, Okla., assignor to Applied Automation, Inc., Bartlesville, Okla.

Filed Oct. 6, 1986, Ser. No. 915,433

Int. Cl.[4] H03M *1/38*

U.S. Cl. 341—120 11 Claims

1. Apparatus for providing an analog-to-digital conversion of an analog signal wherein said analog-to-digital conversion is effected in a voltage recirculation loop and wherein a number of conversion iterations are included in a conversion cycle to resolve said analog signal into a number of binary bits, and

wherein an auto-zero mode is introduced prior to an analog-to-digital conversion cycle, said apparatus comprising:

a first sample and hold circuit having an input and an output, wherein said first sample and hold circuit samples a voltage when a first switch means associated with said first sample and hold circuit is in a first position and wherein said first sample and hold circuit holds the voltage sampled when said first switch means was in said first position when said first switch means is switched to a second position;

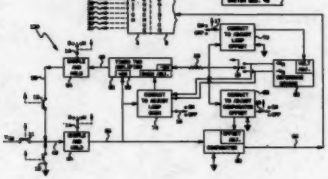
an operational amplifier having a non-invering input, an inverting input, a gain adjust input, and an output;

a feedback resistor connected from said output to said inverting input of said operational amplifier;

an input resistor, having essentially equal value of resistance as said feedback resistor and having a first terminal connected to said inverting input of said operational amplifier whereby the unadjusted voltage gain of said operational amplifier if the input voltage is applied to the non-inverting input is approximately equal to two and wherein the unadjusted voltage gain of said operational amplifier if the input voltage is applied to said second terminal of said input resistor is approximately equal to unity;

means for connecting said output of said first sample and hold circuit to said non-inverting input of said operational amplifier;

a reference voltage source including a positive and a negative reference voltage;



a second switch means having a first position and a second position, wherein said positive reference voltage is connected to said second terminal of said input resistor when said second switch menas is in said first position, wherein said negative reference voltage is connected to said second terminal of said input resistor when said second switch means is in said second position;

means for establishing an adjustment signal responsive to the voltage appearing at the non-inverting input of said operational amplifier and the voltage of said reference voltage source, and for connecting said adjustment signal to said gain adjust input of said operational amplifier so that the gain of said operational amplifier is adjusted in response to said adjustment signal;

a second sample and hold circuit having an input and an output, wherein said second sample and hold circuit samples a voltage when a third switch means associated with said second sample and hold circuit is in a first position and wherein said second sample and hold circuit holds the voltage sampled when said third switch means was in said first position when said third switch means is switched to a second position;

means for connecting said output of said operational amplifier to said input of said second sample and hold circuit;

a fourth switch means for connecting said output of said second sample and hold circuit to said input of said first sample and hold circuit;

a fifth switch means for applying said analog signal to said input of said first sample and hold circuit;

a first comparator means operatively connected to said output of said first sample and hold circuit for comparing said output of said first sample and hold circuit to a base voltage and for producing a first digital signal therefrom;

a storage register for receiving said first digital signal and for producing a first switching signal responsive to said first digital signal;

means for connecting said first switching signal to said second switch means and for operating said second switch means in response to said first switching signal;

computer means for generating a second, a third, a fourth, and a fifth switching signal; and

means for connecting said second, third, fourth and fifth switching signals to said first, third, fourth and fifth switch means respectively, wherein said first, third, fourth and fifth switch means are switched so as to effect a conversion of said analog signal to digital form in accordance with an iterative algorithm.

4,799,042

APPARATUS AND METHOD FOR OFFSET VOLTAGE CORRECTION IN AN ANALOG TO DIGITAL CONVERTER

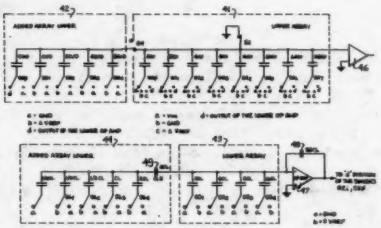
Pierangelo Confalonieri, Canonic D'Adda, Italy; Daniel Senderowicz, Berkeley, Calif., and Germano Nicollini, Piacenza, Italy, assignors to SGS Microelettronica S.p.A, Italy

Filed Dec. 1, 1986, Ser. No. 936,368

Claims priority, application Italy, Dec. 19, 1985, 23294 A/85

Int. Cl.[4] H03M 1/06

U.S. Cl. 341—118 **4 Claims**



1. A method of correcting for error voltages, such as offset voltages present in circuitry of systems using voltage comparators, said method comprising the steps of:

(a) providing a successive approximation analog-to-digital converter provided with a primary capacitor array interconnected with a first switch means used for grounding a summing node on said converter and a second switch means for providing an input signal charge to said primary capacitor array, said input signal charge representing a chord value of said input signal charge;

(b) providing a dedicated offset voltage correction register for storing a digital representation of a correction signal;

(c) providing a first supplementary capacitor array for storing charges representing an analog of a major portion of a correction signal, said first supplementary capacitor array being provided in addition to said provided primary capacitor array;

(d) providing a third switch means between said first supplementary capacitor array and said provided primary capacitor array, said third switch being located to assure isolation of said first supplementary capacitor array from said provided primary capacitor array after performing a correction;

(e) storing a digital representation of a correction signal in said dedicated correction register;

(f) storing an input signal charge, representing a chord value

of said input signal, in said primary capacitor array through said second switch means;

(g) grounding said summing node of said successive approximation analog-to-digital converter through said first switch means;

(h) closing said third switch means between said first supplementary capacitor array and said primary capacitor array;

(i) performing a digital-to-analog conversion of said stored correction signal in said dedicated offset correction register, said conversion being performed simultaneous with said steps of storing said input signal and grounding said summing node and closing said third switch means;

(j) precharging said first supplementary capacitor array with a major portion of a correction signal charge equivalent to an analog value resulting from said performed digital-to-analog conversion step;

(k) opening said first switch means;

(l) raising the voltage potential at said summing node by an amount equivalent to said stored major portion of said correction signal charge in said first supplementary capacitor array;

(m) opening said third switch means in a timely manner and thereby isolating said first supplementary capacitor array from said primary capacitor array without affecting normal operation of said successive approximation analog-to-digital converter;

(n) grounding said primary capacitor array through said second switch means;

(o) combining an input voltage equivalent of said input signal charge and an offset voltage equivalent of said correction signal charge at said summing node and thereby providing a compensated input value at said summing node; and

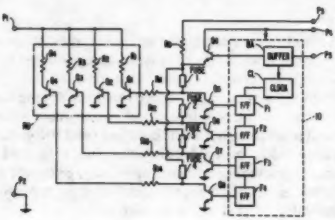
(p) operating said successive approximation analog-to-digital converter.

4,799,043

CIRCUIT RESISTANCE ADJUSTING DEVICE

Kenji Ueda, Ohtsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Division of Ser. No. 839,718, Mar. 14, 1986, Pat. No. 4,713,602. This application Jun. 29, 1987, Ser. No. 67,004
Claims priority, application Japan, Mar. 14, 1985, 60-52105
Int. Cl.[4] H03M *1/78*
U.S. Cl. 340—825.06 **9 Claims**



6. An apparatus for sensing a particular condition, said apparatus comprising:

a. sensing means,

b. first circuit means coupled to said sensing means for generating first and second signals,

c. second circuit means responsive to the signals generated by said first circuit means for adjusting the sensitivity of said sensor, said second circuit means comprising:

(i) resistance means including a plurality of resistances,

(ii) switching means coupled to said resistance means for selectively and sequentially connecting one or more of said plurality of resistances to produce a combined resistance,

(iii) patterning means, coupled to said switching means and responsive to said first signal generated by said first circuit means, for controlling said switching means to selectively connect said plurality of resistances in accordance with a predetermined pattern for adjusting the sensitivity of said sensor, and

(iv) holding means, responsive to said second signal generated by said first circuit means, for holding said patterning means and fixing the connection of said plurality of resistances so that said combined resistance is permanently fixed,

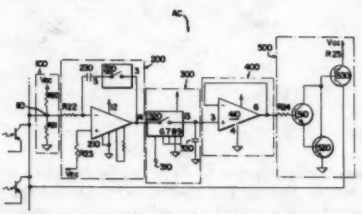
wherein said switching means includes a plurality of switching elements, which respectively correspond to said plurality of resistances, and a plurality of fuses respectively connected to said plurality of switching elements, said fuses are adapted to be selectively fused off upon the application of said second signal to said holding means.

4,799,044

PHOTOTRANSISTOR APPARATUS WITH CURRENT INJECTION AMBIENT COMPENSATION

Timothy E. Masters, Georgetown, and Wayne J. Wehrer, Austin, both of Tex., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 830,408, Feb. 18, 1986, Pat. No. 4,713,534. This application Aug. 6, 1987, Ser. No. 83,321
Int. Cl.[4] G08C *21/00*
U.S. Cl. 341—5 **6 Claims**



1. A coordinate detection touch input apparatus for determining the position of a stylus adjacent an electronic display in the presence of ambient light, comprising:

an array of light emitters and phototransistors disposable around the periphery of the electronic display, individual associated emitters and phototransistors aligned in emitter-phototransistor pairs;

means for sequentially activating emitter-phototransistor pairs, each phototransistor being activated for a longer time than the associated emitter, an activated phototransistor current being a function only of ambient conditions, including incident ambient light, when the associated emitter is unactivated;

a dynamic ambient compensation network comprising means for injecting a compensation current at the phototransistor collector during activation of the associated emitter, the compensation current being a function only of the current in the phototransistor due to ambient conditions, including incident ambient light; whereby

the presence of the stylus adjacent the electronic display is determined when light from activated emitters is not received by associated phototransistors.

4,799,045

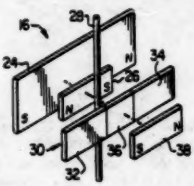
METHOD OF DETECTING A LABEL USED IN AN ANTI-THEFT SURVEILLANCE SYSTEM

Edward R. Fearon, Richardson, Tex., and Robert E. Fearon, Tulsa, Okla., assignors to E.A.S. Technologies, Inc., Richardson, Tex.

Continuation of Ser. No. 828,541, Feb. 12, 1986, Pat. No. 4,682,154. This application Jul. 17, 1987, Ser. No. 74,956

Int. Cl.[4] G08B *13/18*

U.S. Cl. 340—572 4 Claims



1. A method of detecting the unauthorized passage of an article through a zone of surveillance, comprising:

transmitting a pair of frequencies in about the range of 1-30 gigahertz within the zone of surveillance;

attaching a label to the article, said label having a magnetically biased element wherein said magnetic bias results from a magnetic field stronger than a magnetic field associated with the earth;

generating a frequency comprising the summation of the pair of frequencies from said label; and

detecting the summation frequency in the zone of surveillance and thereby detecting the unauthorized passage of the article therethrough, the summation frequency being detected to exploit and improve radiation achieved therewith.

4,799,046

METHOD AND CIRCUIT FOR DETECTING AND MONITORING THE TEMPERATURE OF A WINDING

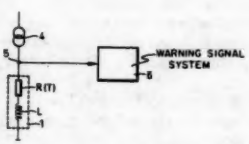
Raymond Heinen, Cologne, Fed. Rep. of Germany, assignor to Leybold-heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 749,010, Jun. 26, 1985, abandoned. This application Jan. 30, 1987, Ser. No. 9,267

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424873

Int. Cl.[4] G08B *17/00*; F16K *31/02*

U.S. Cl. 340—595 9 Claims



1. A method for monitoring the temperature of a winding of a coil, the winding having a temperature-dependent resistance, in which said coil is a magnet coil of a magnetic valve having a body comprising: supplying a holding current holding the body of the valve in a certain position, and

utilizing the holding current simultaneously as a measurement current.

4,799,047

LIQUID LEVEL DETECTING AND INDICATING SYSTEM WITH COIL TYPE MEASURING DEVICE

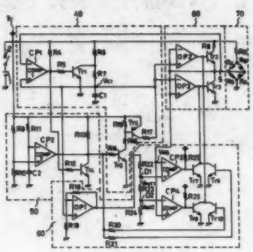
Mitsuhiro Saitoh, Oobu, Japan, assignor to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 8, 1987, Ser. No. 130,326

Claims priority, application Japan, Dec. 17, 1986, 61-300726

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—618 6 Claims



1. A level detecting and indicating system for detecting a level of a measured object on the basis of a resistance changed in accordance with variation of the position of said measured object and indicating the level in response to a magnetic field produced to correspond to the resistance, comprising:

power supply means with switching means for supplying an electric power and stopping the power supply;

gauging circuit means coupled through said switching means to said power supply means and including a bridge circuit comprising at least variable resistor means and coil means, said variable resistor means being arranged such that its resistance is changed in accordance with the variation of the position of said measured object;

potential followup circuit means for detecting the voltage at one end of said variable resistor of said gauging circuit means, said potential followup circuit means including a capacitor which is coupled through said switching means to said power supply means and charged with first and second time constants so that its voltage becomes equal to the detected voltage at the one end of said variable resistor means, said first and second time constants being switched from each other in response to first and second charging signals;

timer circuit means including time measuring means for measuring a time period elapsed from a turning-on of said switching means, said timer circuit means generating said first charging signal to said potential followup circuit means before elapse of a predetermined time period from the turning-on of said switching means so that said capacitor is charged rapidly with said first time constant and generating said second charging signal thereto after the elapse of said predetermined time period so that it is charged slowly with second time constant;

disturbance detecting circuit means coupled to one end of said capacitor of said potential followup circuit means and the one end of said variable resistor means of said gauging circuit means for comparing the voltages thereof with each other to detect a abrupt variation of the voltage at the one end of said variable resistor means and generating a control signal in accordance with the result of the detection; and

potential control circuit means coupled to said disturbance detecting circuit means for controlling magnitude of the voltage at the end of said variable resistor means in response to said control signal from said disturbance detecting circuit to remove the abrupt variation of the voltage thereat.

4,799,048

ACCUMULATOR

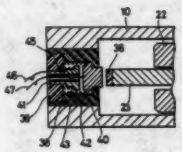
Takahiro Goshima, Kakamigahara; Yoshiyuki Hattori, Toyoake; Hiroji Kinbara, Okazaki; Hiromi Otsuki, Anjo; Yoshihisa Nomura, and Nobuyasu Nakanishi, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 781,472, Sep. 30, 1985, abandoned. This application Jun. 10, 1987, Ser. No. 60,959

Claims priority, application Japan, Sep. 28, 1984, 59-204546; Oct. 19, 1984, 59-220670

Int. Cl.[4] G08B *21/00*; F16K *37/00*

U.S. Cl. 340—626 12 Claims



1. An accumulator comprising:
a casing having an inlet/outlet port;
a cylinder disposed in said casing;
a piston slidably disposed in said cylinder, said cylinder and one end of said piston jointly defining a reservoir of variable volume communicating with said inlet/outlet port and said piston having a coaxial recess extending from the other end of said piston to a bottom therein;
a piston ring held on an outer surface of said piston and lying in substantially the same plane as the inner surface of said bottom;
a piston rod axially movably disposed in said casing and having an end slidably fitted in said recess; and
a spring engaged with said piston rod for normally urging said piston rod toward said bottom to keep said end of said piston rod and said piston ring positioned in substantially the same position at all times with respect to a longitudinal axis of said piston to force said piston to reduce the volume of said reservoir.

5. An accumulator comprising;
a casing having an inlet/outlet port;
a cylinder disposed in said casing;
a piston axially slidably disposed in said cylinder, said cylinder and one end of said piston jointly defining a reservoir of variable volume communicating with said inlet/outlet port and said piston having a coaxial recess extending from the other end of said piston to a bottom therein;
a piston ring held on an outer surface of said piston, said piston ring and the inner surface of said bottom being located in substantially the same plane;
a piston rod axially movably disposed in said casing and having an end slidably fitted in said coaxial recess;
a spring engaged with said piston rod for normally urging said piston rod to keep said end of the piston rod and said piston ring positioned in substantially the same position at all times with respect to the longitudinal axis of said piston to force said piston into said reservoir; and
means for electrically detecting the position of said piston in said cylinder.

4,799,049

IMAGE POSITION CONTROL

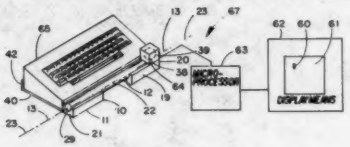
Harold C. Avila, 5399 Sierra Vista Ave., Riverside, Calif. 92505

Filed Jan. 25, 1985, Ser. No. 694,816

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—709 12 Claims

1. A control that uses both rotational movement and sliding movement to position an image on a screen for use with means for detecting the movement where the means for detecting senses the movement and a microprocessor that interprets the movement detected to position said image on said screen and means for displaying said image on said screen, comprising:
a body having a concave surface defining a notch; and
a cylindrical bar having a bar axis, said bar being matingly situated in the notch of the body for rotatable and slidable



movement relative to the body, said bar being rotatable coupled to the body for movement about the bar axis and slidably coupled to the body for movement in a direction parallel to the bar axis, rotating movement of said bar causing said image to move in a first direction on said screen and sliding movement of said bar causing said image to move in a second direction on said screen.

4,799,050

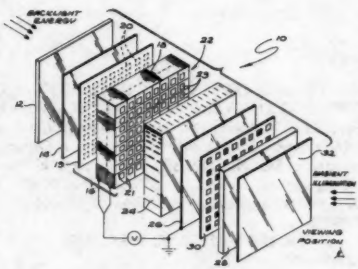
FULL COLOR LIQUID CRYSTAL DISPLAY

John C. Prince, Kettleby, and James F. Farrell, Pickering, both of Canada, assignors to Litton Systems Canada Limited, Etobicoke, Canada

Filed Oct. 23, 1986, Ser. No. 922,186

Int. Cl.[4] G02F *1/13*

U.S. Cl. 340—765 19 Claims



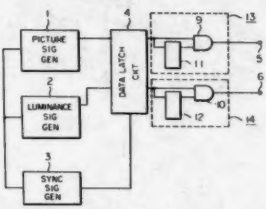
1. A display comprising, in combination:
(a) a plurality of adjacent light-conducting cells disposed in a planar array, each said cell having means associated with it for modulating the amount of visible light passing therethrough;
(b) a phosphor layer behind said cell array, said layer being capable of emitting visible light through said array when irradiated from behind with ultraviolet light;
(c) an ultraviolet light source behind said phosphor layer for irradiating said phosphor layer with ultraviolet light; and
(d) a fiber optic plate disposed behind said cell array and in front of said phosphor layer, said plate including a plurality of adjacent and parallel light-conducting pipes, each said pipe comprising a bundle of optical fibers and having a front end in light-conducting communication with one of said cells, and a rear end in light-conducting communication with said phosphor layer.

4,799,051

DISPLAY CONTROL APPARATUS

Noriaki Tanaka, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 5, 1987, Ser. No. 58,906
Claims priority, application Japan, Jun. 12, 1986, 61-136744
Int. Cl.[4] G09G 1/00
U.S. Cl. 340—811 5 Claims



1. A display control apparatus comprising:

a picture signal generator which produces a picture signal of a character, pattern, or the like;

a luminance signal generator which produces a luminance signal;

a synchronizing signal generator which produces a synchronizing synchronizing the picture signal produced from said picture signal generator and the luminance signal produced from said luminance signal generator and causes the synchronized picture signal and synchronized luminance signal to rise and fall at the same time;

data latch circuit which produces a synchronized picture signal from the picture signal and the synchronizing signal and a synchronized luminance signal from the luminance signal and the synchronizing signal;

a first pulse width adjuster receiving the synchronized picture signal as an input and comprising a delay circuit which produces a delayed synchronized picture signal from the synchronized picture signal and a logic circuit which performs a logical operation on the synchronized picture signal and the delayed synchronized picture signal and produces an output picture signal;

a second pulse width adjuster receiving the synchronized luminance signal as an input and comprising a delay circuit which produces a delayed synchronized luminance signal from the synchronized luminance signal and a logic circuit which performs a logical operation on the synchronized luminance signal and the delayed synchronized luminance signal and produces an output luminance signal;

when one of the synchronized picture signal and the synchronized luminance signal is true and the other is false, the one of said first and second pulse width adjusters with the true signal as it input producing and output signal having a shortened true interval and the other of said first and second pulse width adjusters with the false signal as it input producing an output signal having a widened false interval with the shortened true interval falling within the widened false interval, thereby producing a predetermined desired display signal; and

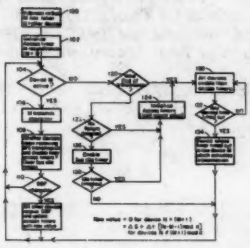
when both the synchronized picture signal and the synchronized luminance signal are true or false, said first and second pulse width adjusters producing output signals having shortened true intervals or widened false intervals of equal length and having phases in agreement, thereby producing a predetermined desired display signal.

4,799,052

METHOD FOR COMMUNICATING DATA ON A COMMUNICATION NETWORK BY TOKEN PASSING

Timothy P. Near, Athens, Ga.; Joseph J. Cleri, Hood, and Kenneth M. Holet, Earlysville, both of Va., assignors to General Electric Company, Charlottesville, Va.

Filed Jan. 13, 1986, Ser. No. 818,222
Int. Cl.[4] H04Q 11/00; H04J 3/02, 3/24
U.S. Cl. 340—825.5 25 Claims



1. In a communication network, having a medium for receiving and transmitting data between a plurality of devices, the data comprising foreground messages and background messages, the foreground messages having a higher priority of transmission than background messages; each device having a receiver for receiving data from the medium; a transmitter for transmitting data to the medium; a medium access timer for controlling access to the medium a medium idle timer for detecting an idle condition on the medium; and a detecting means for detecting the transmission of a background message; a method of determining access to the medium by each device comprising the steps of:

(a) assigning each device a unique medium address number;

(b) loading each medium access timer of each device with a value representative of the unique medium address number of the device;

(c) starting a count on each medium access timer;

(d) selecting at least one device to start transmitting data on the medium, the data including the unique medium address number assigned to the transmitting device, a start of transmission condition, and an end of transmission condition;

(e) detecting the transmission of a background message by the detecting means;

(f) setting the detecting means for each device upon detecting the transmission of a background message;

(g) stopping the medium access timer of each device upon receiving the start of transmision condition from the transmitting device;

(h) loading the medium access timer of each device with a value representative of each device's own unique medium address number and the unique medium address of the transmitting device;

(i) starting a count on each medium access timer upon receiving the end of transmission condition from the transmitting device;

(j) comparing each medium access timer to a predetermined value;

(k) permitting access to the medium when the medium access timer of a device reaches a predetermined number;

(l) determining the state of the detecting means of the device upon obtaining access to the medium;

(m) transmitting data on the medium, the data including the unique medium address number assigned to the transmitting device, a start of transmission condition, and an end of transmission condition;

(n) inhibiting the transmission of background messages from the device if the detecting means is set; and

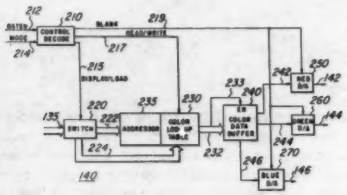
(o) resetting the detecting means at the end of transmitting data from the device.

4,799,053

COLOR PALETTE HAVING MULTIPLEXED COLOR LOOK UP TABLE LOADING

Jerry Van Aken, Sugarland, and Karl Guttag, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 28, 1986, Ser. No. 856,736
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—703 22 Claims



1. A color palette system comprising:

a controller having a data port;

a pixel map memory having a data port coupled to said controller data port and a data output, said pixel map memory having a plurality of pixel color codes defining a visual image, each pixel color code stored at a memory location corresponding to a video screen location;

a memory controller connected to said pixel map memory for sequentially applying memory addresses to said pixel map memory for recalling pixel color codes from said pixel map memory at said data output in a predetermined order corresponding to the raster scan of a video screen;

a switch having an input connected to said pixel map memory data output and having first and second outputs;

a color look up table having a first input connected to said switch first output for addressing said color look up table and having a second input connected to said switch second output for supplying data to be stored in said color look up table, said color look up table receiving said recalled pixel color codes at said first input, and said color look up table having a plurality of color registers having stored therein color data words;

a video signal generator connected to said color look up table for generating a video output signal having color characteristics corresponding to color data words recalled from said color registers; and

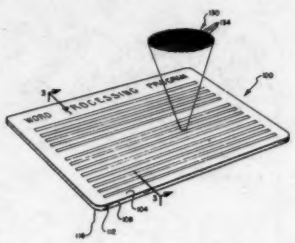
a mode control device connected to said color look up table and responsive to at least one mode control signal for causing said color look up table to operate in one of a normal mode and a color look up table load mode wherein each pixel color code received from said pixel map memory selects one of said color registers for recall of one of said color data words stored therein for transmission to said video signal generator during said normal mode and wherein a predetermined sequence of pixel color codes recalled from said pixel map memory at said data output are presented to said color look up table at said second input thereof and stored in said color registers thereby loading said color data words into said color registers during said color look up table load mode.

4,799,054

MOUSE OPERATING PAD

V. Dean House, Orem, Utah, assignor to Data Pad Corp., Provo, Utah

Filed Feb. 18, 1987, Ser. No. 15,945
Int. Cl.[4] G09G 1/00
U.S. Cl. 340—710 40 Claims



1. A mouse operating pad for use on a work surface at a work station to permit high resolution operating of a mouse at the work station, the mouse operating pad comprising:

a control layer opposed first and second sides, said control layer being comprised of a first material;

a control surface, formed on said first side of said control layer, for contact by a tracking member of the mouse;

means for supporting said control layer and comprising first and second sides, one of which supports said control layer and the other side resting on said work station, said support means being comprised of a second material; and

said support means and said control layer being attached together over a relatively small area and separable over the remainder of their overlying area,

wherein said second material is relatively resilient in relation to said first material and wherein said first material is relatively hard in relation to said second material such that said first material is sufficiently resistant to deformation caused by moving or resting said mouse on the control surface to isolate said control surface from dimensional irregularities occurring at either of the first or second sides of said support means.

4,799,055

OPTICAL MOUSE

Eric Nestler, Acton, and Thomas F. Knight, Belmont, both of Mass., assignors to Symbolics Inc., Cambridge, Mass.

Filed Apr. 26, 1984, Ser. No. 604,111
Int. Cl.[4] G09G 3/02
U.S. Cl. 340—710 17 Claims

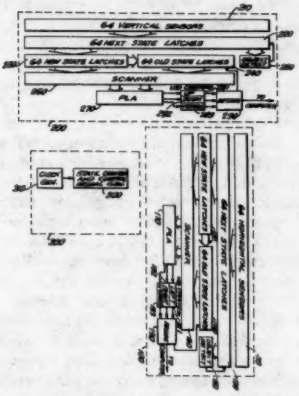
1. In a device for controlling the position of a visual display cursor, wherein the device is movable in a plane defined by two non-parallel axes and having a surface pattern of relatively light and dark areas separated by optical edges and having means responsive to the motion of the device on the surface pattern relative to the two non-parallel axes to produce signals representing a direction of motion for the cursor, the improvement wherein the means comprises:

means for optically sensing the surface pattern comprising a plurality (N) of prechargeable photon sensors disposed in a single row along each axis,

means for periodically sensing the presence of an edge in at least one preselected portion of each row of sensors to define a sensor state for each axis for each period, comprising means for precharging the sensors every period and object detecting means for storing the state of each of P groups of Q sensors in each period, where $P \times Q = N$, when R adjacent sensors in each of the P groups discharge below a given threshold and where $R < Q$ and

motion detecting means for each axis and independent of the other axis for determining if movement has occurred

relative to each axis and comprising means for scanning the state of each set of S adjacent sensors in each of the P groups of Q sensors where S<Q, means for comparing



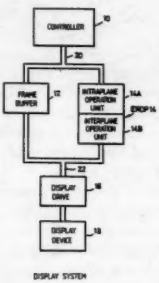
the sets of adjacent sensors for successive states and means for producing a separate direction signal for each axis from the comparisons.

4,799,056

DISPLAY SYSTEM HAVING EXTENDED RASTER OPERATION CIRCUITRY

Etsuo Hattori, Shiga; Tomoyuki Iwami, Yamato; Yoshihiro Miyazaki, Shiga, and Ryutaroh Ohbuchi, Tokyo, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1987, Ser. No. 35,955
Claims priority, application Japan, Apr. 11, 1986, 61-82275
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—799 **8 Claims**



DISPLAY SYSTEM

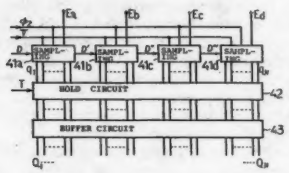
1. A display system comprising:
a frame buffer for storing information representing one or more images, said information being organized into a plurality of memory planes;
a display device for visually displaying images stored in said frame buffer;
an extended raster operation circuit for performing logical operations on information in the frame buffer and for storing the results of the logical operations in the frame buffer; and
a controller for controlling the extended raster operation circuit;
characterized in that the extended raster operation circuit comprises:
an intraplane operation unit for performing intraplane logical operations specified by the controller on information in the frame buffer, each intraplane logical operation having at least one input operand and at least one output result, all operands and results of a given intraplane logical operation being in a single memory plane; and
an interplane operation unit for performing interplane logical operations specified by the controller on the results of the intraplane logical operations, each interplane logical operation having at least one input operand and at least one output result, the operands and results of a given interplane logical operation being in at least two memory planes.

4,799,057

CIRCUIT FOR DRIVING A MATRIX DISPLAY DEVICE WITH A PLURALITY OF ISOLATED DRIVING BLOCKS

Makoto Takeda, Tenri; Kunihiko Yamamoto, Nara; Nobuaki Matsuhashi, Tenri, and Hiroshi Take, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 18, 1985, Ser. No. 756,267
Claims priority, application Japan, Jul. 23, 1984, 59-155051
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—811 **3 Claims**

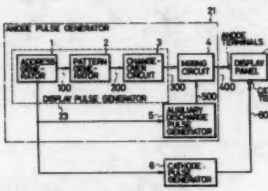


1. A driving circuit for a matrix liquid crystal display device having a plurality of liquid crystal picture elements arranged in a matrix and a plurality of switching transistors each connected to a respective picture element, comprising:
a plurality of successive driving blocks for providing data signals to said plurality of switching transistors, each driving block including,
shift register means for receiving a data pulse signal at a first input terminal thereof, a clock signal at a second input terminal thereof, and outputting said data pulse signal at successive output terminals thereof in response to said clock signal,
a plurality of switching circuits each connected to a respective output terminal of said shift register means and a data voltage input terminal, and
sample-and-hold means for sampling and holding a data signal from said data voltage input terminal through said switching circuits for transmission to a respective switching transistor in response to a data pulse signal applied at a respective output terminal; and
control means for controlling the operation of said plurality of driving blocks including means for inhibiting said shift register means from receiving said clock signal, said control means providing control signals to said means for inhibiting such that only one driving block is operative to provide said voltage signals to said switching transistors at any one instant of time.

4,799,058
DRIVING APPARATUS FOR A GAS DISCHARGE DISPLAY PANEL

Yukio Okamoto, Sagamihara; Shinichi Shinada, Kokubunji; Kenkichi Suzuki, Mobara, and Akihiko Kougami, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 791,758
Claims priority, application Japan, Oct. 31, 1984, 59-227731; Dec. 17, 1984, 59-264472; May 29, 1985, 60-114079
Int. Cl.[4] G09G 3/28
U.S. Cl. 340—811 6 Claims



1. A driving apparatus for a gas discharge display panel; said display panel comprising:

a plurality of parallel cathodes arranged on a substrate and connected by polyphase wiring;

a plurality of parallel barrier ribs disposed on said cathodes in such a manner as to cross said cathodes at right angles;

a plurality of parallel anodes disposed on a transparent face plate in parallel with said barriers;

a driving circuit comprising:

a cathode pulse generator providing cathode pulses at its output, said output being coupled to said cathodes;

an anode pulse generator providing anode pulses at its output, said output being coupled to said anodes, said anode pulse generator including a display pulse generator for generating display pulses;

an auxiliary discharge pulse generator for generating auxiliary discharge pulses; and

a mixing circuit mixing said display pulses and auxiliary discharge pulses, said display pulse generator including an address generator for generating a digital address signal, a pattern generator for converting said digital address signal to a digital pattern signal corresponding to a display pattern, and a changeover circuit for selecting one of said digital pattern signal and its inverted signal as said display pulses;

said changeover circuit including a switching circuit, a plurality of logic circuits each including a first AND gate, a second AND gate, an OR gate, a first inverter and a second inverter, said inverters having as respective inputs said digital pattern signal and a signal from said switching circuit, said first AND gate having as inputs said digital pattern signal and said signal from said switching circuit, and said second AND gate having as inputs the outputs of said first and second inverters, and said OR gate having as inputs the outputs of said first and second AND gates and providing said display pulses at its output.

4,799,059
AUTOMATIC/REMOTE RF INSTRUMENT MONITORING SYSTEM

Mervin L. Grindahl, and Quentin S. Denzene, both of Waseca, Minn., assignors to EnScan, Inc., Minneapolis, Minn.

Filed Mar. 14, 1986, Ser. No. 839,889
Int. Cl.[4] G08C 17/00
U.S. Cl. 340—870.03 32 Claims

1. An RF transponder suitable for use with an automatic/-remote instrument monitoring system wherein the transponder is one of a plurality of such transponders configured to operate with at least one of a plurality of parameter sensing instruments remotely located from an interrogate/receiver which transmits an RF activation signal to said transponders and which receives and processes RF transponder signals received from the transponders, said transponder comprising:

preamble field means for providing a preamble field of predetermined preamble data;

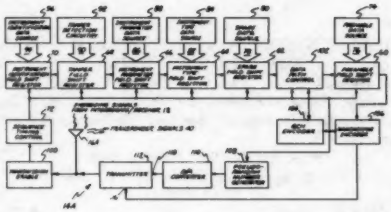
instrument parameter field means adapted for interconnection to a parameter sensing instrument for providing an instrument parameter field of instrument parameter data sensed by the instrument;

instrument identification field means for providing an instrument identification field of instrument identification data;

BCH error control coding means for error control coding at least a portion of the fields of data including the preamble field data, instrument parameter field data, and instrument identification field data, and for providing an error control code field of BCH error control code data;

transmission enable means for receiving an RF activation signal from an interrogate/receiver and for providing a transponder enable signal in response thereto;

sequence control means coupled to the transmission enable means, preamble field means, instrument parameter field means, instrument identification field means and BCH error control code means, for causing the fields of data to be assembled in a predetermined manner to produce a



plurality of transponder information packets in which the BCH error control code field follows the instrument identification field, the instrument identification field follows the instrument parameter field, and the instrument parameter field follows the preamble field, in response to the transponder enable signal;

transmission encoding means for transmission encoding the transponder information packets and producing transmission encoded transponder information packets;

data path control means for causing the portion of the fields of data to be error control coded to be simultaneously transferred to the transmission encoding means and to the BCH error control coding means, and for causing the error control code field of data to be transferred to the transmission encoding means following the transfer to the transmission encoding means of the portions which have been BCH error control coded;

RF transmitter means operatively coupled to receive the transmission encoded transponder information packets for transmitting an RF transponder signal including the transmission encoded transponder information packets; and

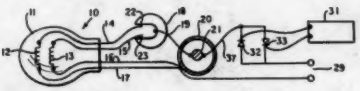
frequency control means coupled to the RF transmitter means for actively varying a frequency of the RF transponder signal such that transponder information packets thereof can be transmitted at different frequencies within a predetermined frequency bandwidth.

4,799,060

TRAFFIC SIGNAL

Richard D. Brugger, 5433 Clinton Dr., Erie, Pa. 16509

Filed Jul. 20, 1987, Ser. No. 75,581
Int. Cl.[4] G08G 1/095; B60Q 1/00
U.S. Cl. 340—907 12 Claims



1. In combination a traffic signal including a bulb and a curved reflector,

said bulb having a major axis extending through said cruved reflector and an electronic circuit,

said bulb having at least two filaments,

means supporting said filaments in said bulb in spaced, generally aprallel, relation to each other and in a plan normal to said major axis whereby said curved reflector directs a predominant beam of light from each said filaments,

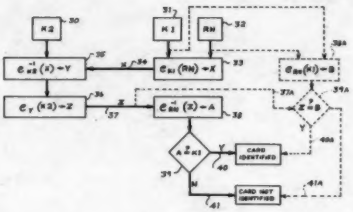
said electronic circuit having switching means to energize said filaments alternately for predetermined periods of time to project light from said reflector alternately at a first angle to said major axis and then at a second angle to said major axis, whereby said beam of light reflected from said curved reflector produces a visual image of scanning.

4,799,061

SECURE COMPONENT AUTHENTICATION SYSTEM

Dennis G. Abraham; Glen P. Double, both of Concord, and Steven W. Neckyfarow, Matthews, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1985, Ser. No. 799,367
Int. Cl.[4] G07D 7/00; H04K 1/00; H04L 9/00
U.S. Cl. 340—825.34 9 Claims



1. A method whereby a first terminal may authenticate a second terminal wherein the terminals each possess an encryption key and the second terminal is authenticated if the encryption keys are equal, the steps of the method comprising:

generating a first number at the first terminal and creating a second number by encrypting the first number using the encryption key of the first terminal;

transmitting the second number to the second terminal;

generating a third number at the second terminal by decrypting the second number using the encryption key of the second terminal;

generating a fourth number at the second terminal by encrypting the encryption key of the second terminal using the third number as the key;

transmitting the fourth number to the first terminal; and

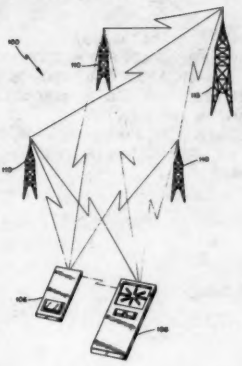
verifying at said first terminal that said fourth number equals the encryption of said encryption key of said first terminal using said first number as key to thereby authenticate said second terminal.

4,799,062

RADIO POSITION DETERMINATION METHOD AND APPARATUS

H. Britton Sanderford, Jr.; Robert E. Rouquette, both of New Orleans, and James D. Arthur, Metairie, all of La., assignors to Axonn Corporation, New Orleans, La.

Filed Apr. 27, 1987, Ser. No. 42,838
Int. Cl.[4] G01S 03/02
U.S. Cl. 342—450 22 Claims



1. A method of radio position determination of an unknown position transmitter using a mobile-reference transceiver and a plurality of base repeater generating a slave grid synchronization pulse for time reference, located at known geographic locations in a geographic area and coupled to a central monitoring station generating a master grid synchronization pulse for time reference, comprising the steps of:

emitting by the unknown position transmitter located within the geographical area, a radio wave having modulation compensation for multipath which also serves as a coarse ranging modulation, and a modulated carrier with an identification code;

receiving by at least three base repeaters the radio wave emitted by the unknown position transmitter and measuring at the base repeaters the relative times-of-arrival of the radio wave with respect to the master grid synchronization pulse for deriving ranging times and therefore ranges from said base repeaters to said unknown position transmitter;

computing from the locations of said base repeaters and the measured times-of-arrival, hyperbolic lines of position for the unknown position transmitter;

computing a coarse-position fix of the unknown position transmitter from the hyperbolic lines of position using a least means squares algorithm;

dispatching a search team having a mobile reference transceiver to the coarse-position fix of said unknown-position transmitter;

transmitting from said mobile reference transceiver located within the coarse-position fix a reference signal having modulation compensation for multipath which also serves as a coarse ranging modulation;

receiving by the base repeaters the reference signal emitted by said mobile reference transceiver and computing a difference between the reference signal and the radio wave, for deriving a differential position vector from said mobile reference transceiver to said unknown position transmitter;

guiding the mobile reference transceiver to said unknown position transmitter using the differential position vector;

emitting a polling message by said mobile reference transceiver;

emitting, in response to receiving the polling message, a reply message by said unknown position transmitter;

independently computing from the polling message and the reply message a local-time-of-flight and therefore the local range from the mobile reference transceiver to the unknown position transmitter; and

emitting an audible sound by said unknown position transmitter for assisting in locating the unknown position transmitter.

4,799,063

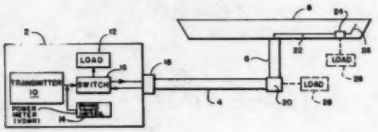
METHOD AND APPARATUS FOR ISOLATING FAULTS IN AN ANTENNA SYSTEM

Gordon S. Hill, Melbourne, Fla., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 14, 1987, Ser. No. 95,705

Int. Cl.[4] G01R *1/00*

U.S. Cl. 343—703 **16 Claims**



1. In a transmitting system having a transmitting means, waveguide transmission lines, an antenna having a given impedance and coupling means, the transmission lines and coupling means connecting the transmitting means to the antenna, a method of isolating faults in the system comprising the steps of:

(a) dividing the transmission lines and the coupling means into at least two sections;

(b) connecting an adapter means to one of the sections;

(c) mating a resistive load having an impedance substantially matching that of the antenna to the adapter means for intercepting and attenuating pulses sent from the transmitting means;

(d) sending a pulse from the transmitting means towards the resistive load;

(e) designating the path between the transmitting means and the adapter means as faultless if the sent pulse is substantially attenuated by the resistive load and not reflected back to the transmitting means; and

(f) designating the path between the transmitting means and the adapter means as faulty if the sent pulse is substantially reflected back to the transmitting means.

4,799,064

GYRATORY PARABOLIC ANTENNA DRIVING DEVICE

Kenichiro Nakamura, Shiga, Japan, assignor to Tsubakimoto Chain Company, Osaka, Japan

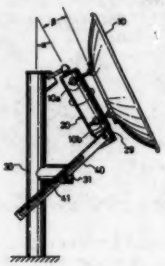
Filed Apr. 27, 1987, Ser. No. 43,143

Claims priority, application Japan, Apr. 30, 1986, 61-98171

Int. Cl.[4] H01O *3/04*

U.S. Cl. 343—766 **14 Claims**

1. A gyratory device for mounting a parabolic antenna on a base frame comprising a stationary hollow housing adapted to be mounted on said frame a motor assembly mounted coaxially with said housing, a coaxial sleeve part mounted for rotation about its longitudinal axis on said stationary housing and enclosing said motor assembly, the outside of said housing and the inside of said sleeve being cylindrical, at least two anti-friction bearings positioned between the outside of said housing and the inside of said sleeve at spaced axial locations, said motor assembly being positioned within said hollow housing between said locations, means mounting said parabolic antenna on said sleeve, and driving connections from said motor assembly to said sleeve to rotate said sleeve on its axis and thereby the antenna upon actuation of said motor.



4,799,065

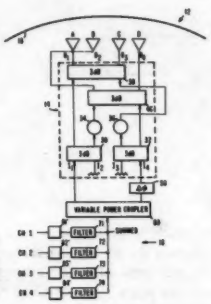
RECONFIGURABLE BEAM ANTENNA

James D. Thompson, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 476,087, Mar. 17, 1983, abandoned. This application Jul. 15, 1986, Ser. No. 885,981

Int. Cl.[4] H01Q *3/26*

U.S. Cl. 343—779 **6 Claims**



1. A reconfigurable beam antenna comprising:

input means for providing a plurality of input signals;

variable power coupling means operatively connected to said input means and having first and second output ports for selectively dividing said input signals into first and second signals at said first and second output ports respectively;

variable phase shifting means operatively connected to said second output port of said variable power divider for selectively shifting the phase of said second signal; and

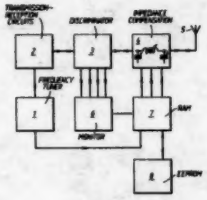
feed network means for distributing said first signal and said phase shifted second signal between a plurality of antenna feeds.

4,799,066

IMPEDANCE MATCHING ARRANGEMENT

Malcolm J. Deacon, Chelmsford, England, assignor to The Marconi Company Limited, Middlesex, England

Filed Jul. 18, 1986, Ser. No. 887,057
Claims priority, application United Kingdom, Jul. 26, 1985, 8518967; Dec. 6, 1985, 8530158
Int. Cl.[4] H01Q 1/50
U.S. Cl. 343—861 17 Claims



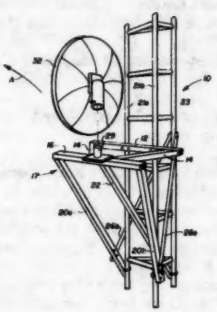
1. An impedance matching arrangement including signal processing means tunable to a selected one of a plurality of frequencies and operative in a mode in which certain of the frequencies occur repetitively, coupled to a frequency dependent impedance; impedance compensation means adapted to present to said signal processing means compensation for the impedance variation of said frequency dependent impedance; and means responsive to an impedance mismatch at a particular frequency for controlling the characteristics of said impedance compensation means when said particular frequency recurs so as to reduce said mismatch.

4,799,067

APPARATUS FOR SUPPORTING AN ELECTRONIC RECEIVING OR SENDING DEVICE ON A TRIPODAL TOWER

Gary L. Tekip, 4152 Waynesburg Rd., Carrollton, Ohio 44615, and Charles A. Mesko, 4747 W. Tuscarawas, Canton, Ohio 44708

Filed Nov. 9, 1987, Ser. No. 118,725
Int. Cl.[4] H01Q 1/12
U.S. Cl. 343—890 12 Claims



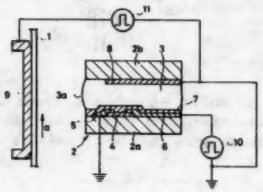
1. An apparatus for supporting a sending or receiving device on a tripodal tower having two base posts and an apex post, said apparatus comprising a base bar adapted to be attached to said two base posts of said tower; two side bars and a front bar, said side bars each having a first end attached to opposed ends of said base bar and a second end thereof attached to said front bar to form a substantially planar geometrically shaped platform with said front bar being substantially parallel to said base bar, said platform being adapted to be attached to said tower at a substantially right angle and substantially horizontal to the ground; two side struts having a first end of each being attached to opposed ends of said front bar, and a second end of each being attached to opposed base posts of said tower at points below the plane of said platform; and a center strut having a first end attached to substantially the center of said front bar and a second end attached to the apex post of said tower.

4,799,068

THERMAL ELECTROSTATIC INK-JET RECORDING METHOD AND AN INK THEREFOR

Koichi Saito; Eiichi Akutsu; Yoshihiko Fujimura, and Nanao Inoue, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1987, Ser. No. 59,507
Claims priority, application Japan, Jun. 10, 1986, 134439
Int. Cl.[4] G01D 9/00
U.S. Cl. 346—1.1 5 Claims



1. In the method of recording an image on a recording medium in which thermal energy is selectively applied locally to selected portions of an ink in response to image signals to heat said selected portions, and an electrostatic field is applied to said ink to cause ink to be jetted from the selectively heated portions onto a recording medium, the improvement comprising using as said ink an ink having an l value at 20° C. not larger than 100 and an l value at a temperature in the range between 70° C. and 200° C. not less than about three times said l value at 20° C., wherein

$$l = \frac{\rho}{\mu}\sqrt{\frac{\alpha a_0}{\rho'}}$$

and ρ, μ and α represent, respectively, the density (kg/m^3), the viscosity (n-sec/m^2) and the surface tension (N/m) of the ink, a_0 represents the distance (m) of a gap to which the electric field is applied, and ρ' represents the density (kg/m^3) of air.

4,799,069

LASER RECORDING APPARATUS

Yoshikazu Sasaki, Sagamihara, and Naoya Misawa, Machida, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 14, 1987, Ser. No. 38,367
Claims priority, application Japan, Apr. 18, 1986, 61-91139; Apr. 18, 1986, 61-91140; Mar. 4, 1987, 62-49841; Mar. 4, 1987, 62-49842
Int. Cl.[4] G01D 9/42; H04N 1/21; H01S 3/13
U.S. Cl. 346—108 17 Claims

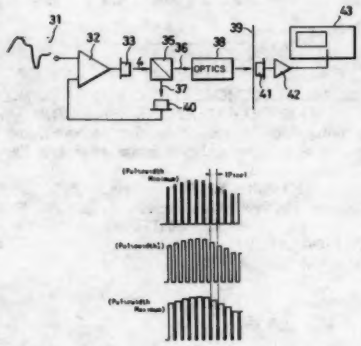
1. A laser recording apparatus adapted to modulate a laser beam level in accordance with a multi-tone image signal level and to cause a laser beam to scan a recording medium transversely and to form images on recording mediums with dots, said apparatus comprising,

a laser light source for generating the laser beam;

drive means for driving said laser light source in accordance

with the multi-tone image signal level so as to modulate the laser beam level;

means for generating pixel pulses corresponding to each dot which forms an image to be recorded;



means for outputting the multi-tone image signals to said drive means in response to each of said pixel pulses; and

means for reducing said laser beam level for a certain time in each of said pixel pulses.

4,799,070

ION FLOW ELECTROSTATIC RECORDING PROCESS AND APPARATUS

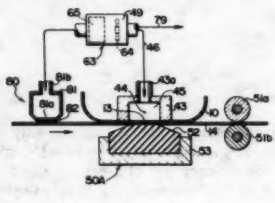
Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Mar. 24, 1987, Ser. No. 31,028

Claims priority, application Japan, Mar. 26, 1986, 61-67940; Mar. 31, 1986, 61-71028

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—159 **28 Claims**



1. An ion flow electrostatic recording process comprising the steps of: disposing a plurality of split record electrodes on one surface of an insulating layer, a record signal being applied to a selected record electrode, forming openings so as to extent through the record electrodes and the insulating layer in a manner such that the record electrodes each surround the periphery of an associated one of the openings to thereby form an ion flow record head, disposing a source of corona ions on one side of the record head on which the record electrodes are located, disposing an electrostatic record paper in superimposed relationship with the other surface of the insulating layer, the record paper comprising a dielectric record layer on a conductive support layer, the dielectric record layer engaging the exposed insulating surface of said insulating layer, applying a record signal across a selected record electrode and the conductive support layer, thereby controlling the passage of a flow of corona ions developed by the source through an ion flow opening.

4,799,071

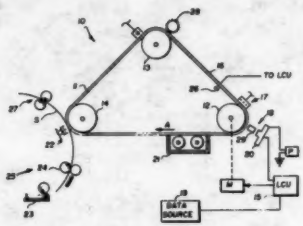
DOT PRINTER WITH AGE COMPENSATION MEANS

Eric K. Zeise, Pittsford, and Yee S. Ng, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 21, 1987, Ser. No. 99,424

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—160 **2 Claims**



1. A dot printer apparatus comprising:

a recording head having a plurality of recording elements for dot-recording on a recording medium during a production run;

driving means for driving each of said recording elements in accordance with respective image data signals for forming an image during the production run;

means for counting a number of prior activations of each recording element and providing correction signals for correction due to nonuniform aging of that recording element; and

means responsive to said correction signals for activating said recording elements during a non-production run.

4,799,072

SEPARATE-EXPOSURE PHOTOGRAPHING APPARATUS

Taizo Akimoto; Masahide Akisada; Takatoshi Seiki; Norio Ookawa; Tatsuo Yoshino, and Yuji Takamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 883,221, Jul. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 828,579, Feb. 11, 1986, Pat. No. 4,629,300, which is a continuation of Ser. No. 447,461, Mar. 21, 1983, abandoned. This application Jan. 19, 1988, Ser. No. 147,560

Claims priority, application Japan, Mar. 21, 1982, 57-45305

Int. Cl.[4] G03B *1/00, 29/00*

U.S. Cl. 354—76 **19 Claims**

1. A separate-exposure photographing system comprising:

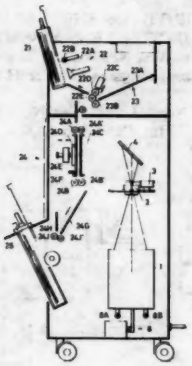
image display means for displaying an image to be photographed;

an optical system for projecting and focusing an image displayed on said image display means on to a film, a photographic lens positioned to received said displayed image, a shutter mechanism to transmit the image focused by said photographic lens and, a single reflecting mirror to project the focused image onto said film, said shutter mechanism comprising a pair of shutter members, a first of said shutter members being normally positioned in an optical path between said lens and said reflecting mirror to block transmission of said focused image and a second of said shutter members being normally positioned outside said optical path and movable a predetermined time following actuation of said first shutter member to block said optical path;

means for horizontally shifting the position of said image display unit and said optical system;

a film feeder for vertically feeding film to be exposed by said optical system, said film feeder comprising a film source magazine for storing a plurality of film units, a temporary

film storage member, and means for removing film from said film source magazine and transferring the film removed from said magazine to said temporary storage member, a film exposure section for receiving said image from said optical system, means for supplying a film unit from said magazine to said exposure section, a film unit



receiver magazine for storing exposed film units, and means for transferring an exposed film unit from said exposure section to said receiver section; and

means for inputting a plurality of photographing conditions for controlling said display means, said photographing conditions including a negative/positive conversion condition, a contrast condition, and a brightness condition.

4,799,073

LENS SHIFTING MECHANISM

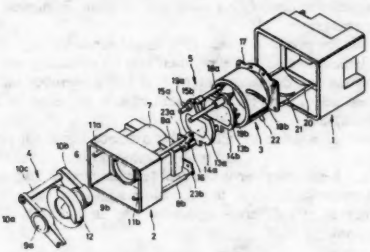
Seiji Asano, and Yasuhiko Tanaka, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 15, 1987, Ser. No. 133,727

Claims priority, application Japan, Dec. 15, 1986, 61-298020; Dec. 15, 1986, 61-298021

Int. Cl.[4] G03B *3/00*; G02B *15/00*

U.S. Cl. 354—195.12 **10 Claims**



1. A lens shifting mechanism incorporated in a camera for shifting a lens system having front and rear lens groups, comprising:

an outer lens barrel fixed to the body of said camera;

an inner lens barrel supported in said outer lens barrel for axial movement relative to said outer lens barrel,

a lens holder in said inner lens barrel holding said front lens group fixedly and said rear lens group movably relative to said inner lens barrel; and

means disposed in said inner lens barrel for causing axial movement of said rear lens group relative to said front lens group as a result of axial movement of said inner lens barrel.

4,799,074

CAMERA

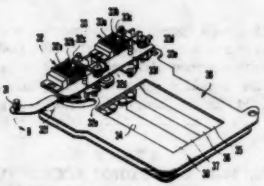
Masaharu Kawamura; Yoshihito Harada; Ryuichi Kobayashi; Masayuki Suzuki, all of Kanagawa; Tsunemasa Ohara, and Yoichi Tosaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 839,127, Mar. 12, 1986, abandoned. This application Mar. 3, 1988, Ser. No. 168,583

Claims priority, application Japan, Mar. 15, 1985, 60-053061

Int. Cl.[4] G03B *9/40*

U.S. Cl. 354—173.1 **15 Claims**



1. A camera comprising:

(a) detecting means for detecting a start of rewinding of a film;

(b) a shutter constructed with a leading blade group and a trailing blade group which are able to open and close an aperture area, said leading blade group being placed at a closed position of said aperture area in an exposure preparatory state and being caused to run from said closed position to an open position by first driving means which is initiated by a release for starting an exposure of said film, while said trailing blade group being placed at an opened position of said aperture area at least immediately before an exposure operation and being caused to run from said opened position to a closed position by second driving means which is initiated after said first driving means has been initiated, thus completing an exposure of said film; and

(c) control means responsive to an output of said detecting means representing an initiation of film rewinding, for running only the trailing blade group, said second driving means causing said trailing blade group of the shutter to run so that said trailing blade group is forced to run to said closed position of the aperture area during the film rewinding thus providing a light shielding for said aperture area.

4,799,075

FILM LOADING DATA DISPLAY DEVICE FOR CAMERA

Seimei Ushiro, Tokyo, and Hiromi Kaneko, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1986, Ser. No. 894,280

Claims priority, application Japan, Aug. 7, 1985, 60-172403

Int. Cl.[4] G03B *17/18*

U.S. Cl. 354—289.1 **3 Claims**

1. A film loading date display device for a camera, comprising

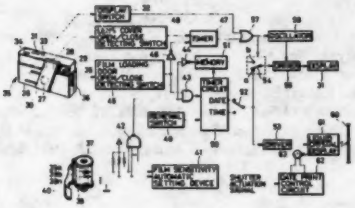
(a) a timer circuit (50) for counting current date information;

(b) a memory (51) for storing date information;

(c) means for transferring current date information from said timer circuit to said memory when film is loaded into the camera, whereby said memory stores the date on which the film is loaded, said transfer means including

(1) switch means (45) connected with a film loading door for producing a first signal when the film loading door is closed;

(2) at least one contact (39) in the film receiving chamber of the camera for producing a second signal when film has been loaded in the camera film chanber; and



(3) logic circuit means (43) connected with said switch means and said contact for activating said timer circuit to transfer current date information to said memory in response to said first and second signals; and

(d) means (31) for displaying said film loading date.

4,799,076

APPARATUS FOR AFFORDING ACCESS TO EXPOSED BUT UNDEVELOPED FILMS IN A DARK CHAMBER

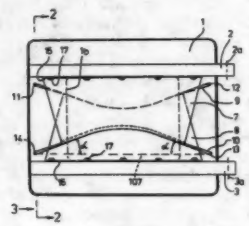
Helmut Zangenfeind, Puchheim; Günther Dömges, Deisenhofen, and Reinhart Würfel, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 21, 1987, Ser. No. 40,868

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 8611054

Int. Cl.[4] G03D *17/00*

U.S. Cl. 354—308 **15 Claims**



1. Apparatus for manipulating exposed but undeveloped photographic films which are confined in containers, comprising a housing defining an internal chamber arranged to receive containers for undeveloped films and having a window affording access to said chamber; and first and second sealing means for preventing penetration of radiation into said chamber by way of said window, said sealing means being disposed in series and said first sealing means defining at least one sealable path which permits a hand to pass therethrough and to reach said second sealing means, said second sealing means including a curtain having an opaque upper panel and an opaque lower panel, one of aid panels overlying the other of said panels and at least one of said panels being movable by the hand extending along said path to permit entry of the hand into said chamber so that the hand can reach and manipulate, particularly withdraw film from, a selected container, each of said panels having a first marginal portion sealingly affixed to said housing, a second marginal portion and means for biasing the second marginal portion of said overlying panel to a predetermined position in which said panels at least partially overlap each other, the second marginal portion of said overlying panel being movable from said predetermined position against the opposition of said biasing means by the hand which extends along said path so that the hand can enter said chamber between said panels, said biasing means comprising an elongated elastic member having end portions affixed to said housing and second portions adjacent said end portions and flanking the second marginal portion of said one panel.

4,799,077

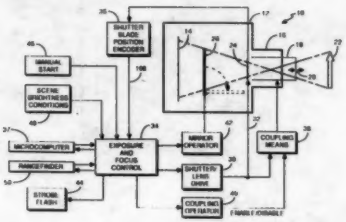
COMMON DRIVE FOR SHUTTER BLADES AND OBJECTIVE LENS ASSEMBLY

Jonathan I. Kaplan, West Newton, and Stephen M. Pero, Medford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 23, 1987, Ser. No. 124,033

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **16 Claims**



11. A photographic camera comprising:

means defining a focal plane;

an adjustable lens for directing scene light along a given path to said focal plane, said lens including a movable element displaceable over a given operational range for adjustment of said lens to focus an image at said focal plane of a subject at a location determined in accordance with a subject distance signal;

an exposure control mechanism including at least one blade member displaceable over a select path to facilitate control of the passage of scene light to said focal plane;

drive means actuatable for displacing said blade member along its select path;

coupling means operable, responsive to a first signal, for coupling said movable lens element to said blade member for displacement therewith and, responsive to a second signal for decoupling said lens element from said blade member;

means for producing said first signal for coupling said lens element to said blade member, and for actuating said drive means for displacement of said blade member along its said select path for movement of said lens element therewith; and

means responsive to said subject distance signal for producing said second signal to decouple said lens element from said blade member when said lens element is displaced to a suitable location for focusing an image of a subject located at a distance represented by said subject distance signal.

4,799,078

CAMERA WITH SHUTTER ACTUATED BY PIEZOELECTRIC ELEMENT AND FLASH LIGHT EMITTING MEANS

Koh Hayama, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 17, 1988, Ser. No. 156,902

Claims priority, application Japan, Feb. 18, 1987, 62-36570

Int. Cl.[4] G03B *7/26, 15/05, 17/38*

U.S. Cl. 354—412 **5 Claims**

1. A camera, comprising:

a single chargeable means;

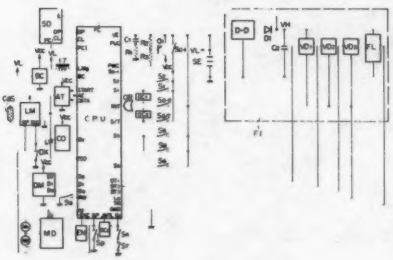
a boosting means for boosting a voltage of a power source to supply a high voltage to charge said chargeable means;

a piezoelectric actuator element for actuating the shutter of said camera;

a first voltage detecting means for detecting that said chargeable means is charged to a first voltage required to drive said piezoelectric actuator element;

a flash light emitting means;

a second voltage detecting means for detecting that said chargeable means is charged to a second voltage required



to drive said piezoelectric element and cause said flash light emitting means to emit light;

a light measuring means for measuring a brightness of an object; and

a selecting means operable in response to an output of said light measuring means for selecting said first voltage detecting means when the brightness of the object is higher than a predetermined brightness and for selecting said second voltage detecting means when the brightness of the object is lower than the predetermined brightness.

4,799,079

ELECTROSTATIC COPYING APPARATUS CAPABLE OF COPYING ON BOTH SURFACES

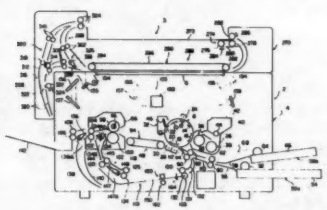
Koji Ujino, Osaka, and Tadashi Fujioka, Toyonaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1987, Ser. No. 49,818

Claims priority, application Japan, May 17, 1986, 61-111815; Nov. 21, 1986, 61-276499

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 SH **15 Claims**



1. In an electrostatic copying apparatus capable of both-surface copying and including a main copying system and a document sending device for conveying a document to be copied through an exposure area, said main copying system including copying paper conveying mans defining a copying paper conveying passage, image forming means for forming an image of a document to be copied on copying paper conveyed through said paper conveying passage, copying paper returning means defining a copying paper returing passage for returning copying paper having the image formed on one surface thereof, and paper re-feed means for receiving the copying paper returned through said paper returning passage and feeding it again to said paper conveying passage, the improvement wherein said document sending device comprises:

document feed means for feeding the document toward the exposure area;

document conveying means for conveying the document through the exposure area;

document returning means defining a document returning passage for conducting the document conveyed through the exposure area to the exposure area again; and

said document feed means comprising a document receiving stand for receiving a stack of documents, a first feed means for feeding documents placed on said document receiving stand one at a time from the uppermost document of the stack, and a second feed means for feeding the documents placed on said document receiving stand one at a time from the lowermost document of the stack.

4,799,080

ELECTROPHOTOGRAPHIC COPYING MACHINE HAVING EDITORIAL FUNCTION

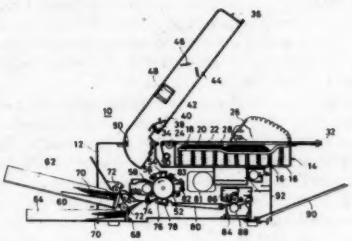
Masakatsu Fujiwara, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Oct. 14, 1986, Ser. No. 918,500

Claims priority, application Japan, Oct. 19, 1985, 60-234332; Nov. 13, 1985, 60-254141; Nov. 18, 1985, 60-259044

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—7 **28 Claims**



1. An electrophotographic copying machine having editorial function comprising:

an original table for placing an original with an original face to be copied facing upward, said original table including supporting means for supporting said original from under its original face, said supporting means being upwardly and downwardly displaceable relative to said original,

a tablet which is composed of a transparent or semitransparent material, and is disposed on said original face of said original placed on said original table, said tablet including a pen movable to specify position on said tablet, said tablet including means for generating positional data representing the position of said pen,

optical scanning means which has a movable light source and is for scanning said original face,

a photosensitive member which is exposed by light from said optical scanning means and forms an electrostatic latent image thereon, and

image forming means for forming a copied image in accordance with positional data from said tablet by means of an electrostatic latent image formed on said photosensitive member and said positional data.

4,799,081

COPYING SYSTEM HAVING COPYING AND SERVICE PROGRAM MODES

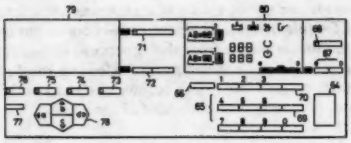
Mitsutoyo Kikuno, Machida; Tatsuo Hirono, Kawasaki; Yoshihiro Nakashima, Tateishi, and Hirobumi Yoshino, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

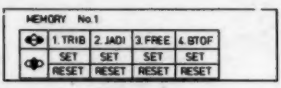
Filed Apr. 24, 1987, Ser. No. 42,448

Claims priority, application Japan, Apr. 28, 1986, 61-100257

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 C **14 Claims**





1. A copying system for copying an image of an original onto a copying paper to make a copy of the original, said copying system having a copying mode for making the copy and a service program mode for adjusting parts of the copying system based on adjusting data, said copying system comprising:

a plurality of keys for selecting modes and for entering data;

input means for inputting the adjusting data for use in adjusting the parts of the copying system in the service program mode, said adjusting data being entered from said keys;

enabling and disabling means for selecting one of the copying and service program modes responsive to a manipulation of at least one of said keys;

service program mode setting means for setting an operation mode of the copying system to the service program mode responsive to a manipulation of at least one of the said keys when enabled by said enabling and disabling means, said enabling and disabling means enabling said service program mode setting means when the service program mode is selected by the keys of said enabling and disabling means and disabling said service program mode setting means when the copying mode is selected by the keys of said enabling and disabling means; and

control means for automatically resetting the adjusting data entered in one or a plurality of predetermined service program modes when the service program mode setting means is disabled by said enabling and disabling means.

4,799,082

ELECTROSTATIC REPRODUCING APPARATUS

Keiichiro Suzuki, 2469, Nagatsuta-Cho, Midori-Ku, Yokohama-Shi, Kanagawa, Japan

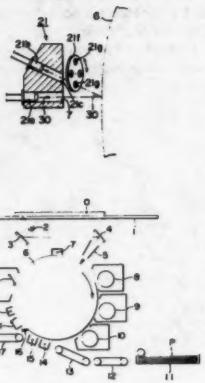
Continuation of Ser. No. 696,319, Jan. 30, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 28,016

Claims priority, application Japan, Feb. 2, 1984, 59-15998; Jun. 29, 1984, 59-134505; Jun. 29, 1984, 59-134507; Nov. 22, 1984, 59-247372

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **17 Claims**

1. In an electrostatic reproducing apparatus in which a plurality of color toners are employed and which comprises means for detecting paper jamming on an image retainer, said detecting means comprising a light source directing a light onto said image retainer and a light receiving means, the improvement characterized in that said light source emits a light



which does not contain a substantial spectral component having a high reflectance for any of said color toners.

4,799,083

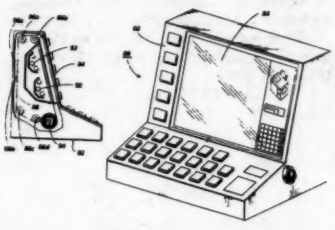
MACHINE-OPERATOR INTERFACE METHODS

Roediger W. Knodt, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1987, Ser. No. 64,726

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **1 Claim**



1. In a reproduction machine, a control panel having a display area for displaying information for operating the machine comprising:

a housing supporting the control panel,

a plurality of rolls, the rolls being secured to the housing for rotating therein,

a scroll, the scroll being entrained about the rolls and having a plurality of segmented sections, each of the sections providing machine control information,

illuminating means disposed within the housing, the illuminating means being positioned to project light toward the display area, a portion of the scroll being disposed intermediate the illuminating means and the display area,

scrolling means connected to scroll to sequentially position each of the segmented sections in the display area to progressively and selectively prompt the operator in machine operation and

a take-up roll, said take-up roll cooperating with said plural-

ity of rolls to expand the number of said segmented sections.

4,799,084

IMAGE FORMING APPARATUS

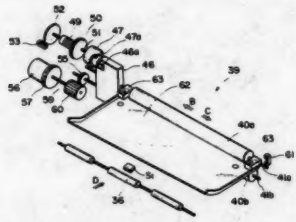
Michiro Koike, Kawasaki; Takashi Ozawa, Ichikawa; Yasuyoshi Yamamoto, Tokyo; Masashi Ohashi, Tokyo; Akiyoshi Kimura, Tokyo; Nobukazu Sasaki, Tokyo; Toshirou Kasamura, Yokohama; Atsushi Kubota, Machida; Tatsuya Shiratori, Yokohama, and Toshihiko Kusumoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,388

Claims priority, application Japan, Apr. 9, 1985, 60-74967; Apr. 10, 1985, 60-77314

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 SH 32 Claims



1. An image forming apparatus, comprising:

an image forming station for conveying a sheet material along a stationary lateral reference position and for forming an image on the sheet material;

refeeding means for refeeding to said image forming station the sheet material on which the image has been formed in said image forming station;

means, provided in said sheet refeeding means, for shifting the sheet material in the lateral direction from the stationary lateral reference position by a predetermined amount, wherein the amount of the shift is predetermined on the basis of a change in a lateral dimension of the sheet material resulting from an image forming operation in said image forming station.

4,799,085

IMAGE RECORDING APPARATUS AND METHOD

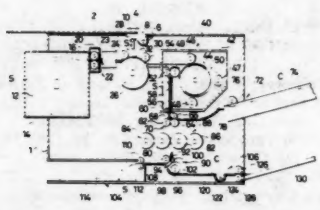
Akihiko Nagumo; Minoru Ishikawa, and Ken Kawada, all of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 3, 1987, Ser. No. 33,936

Claims priority, application Japan, Apr. 3, 1986, 61-77198; Apr. 16, 1986, 61-87701; Oct. 20, 1986, 61-248974

Int. Cl.[4] G03B *27/72*

U.S. Cl. 355—27 12 Claims



1. An image recording apparatus which employs a photo- and pressure-sensitive heat-developable material having a substrate and a layer formed on said substrate from a material which is photosensitive and heat-developable and which enables the developed image to be fixed by heat and pressure, said photosensitive material being adapted to be exposed and heated for development of the image formed by the exposure followed by pressurizing and heating for the purpose of fixing the developed image, at least part of said material being contained in common microcapsules, said apparatus comprising:

exposure means for exposing said photosensitive and pressure sensitive developable material to an original image to form a latent image on the surface of said photosensitive and pressure sensitive developable material;

heating developing means for setting the portion of said photosensitive and pressure-sensitive developable material carrying said latent image so as to produce a developed image;

a pair of pressing rolls for subjecting said photosensitive material to a sufficient pressure to rupture said common microcapsules; and

heating means for heating said pressing rolls.

4,799,086

TONER LAYER FORMING DEVICE

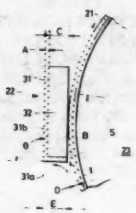
Ikuo Mori, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1987, Ser. No. 14,254

Claims priority, application Japan, Feb. 19, 1986, 61-32819

Int. Cl.[4] G03G *15/09*

U.S. Cl. 355—3 DD 14 Claims



1. A toner layer forming device for an electrostatic image reproduction machine having a photosensitive latent image carrier, comprising:

fixed magnetic means including a plurality of spaced poles of opposite polarity;

non-magnetic sleeve means including a developing surface rotatable about the magnetic means for carrying a thin layer of toner particles and for transferring a portion of the layer to the carrier;

toner supply means for supplying a layer of toner particles onto the surface of the sleeve means;

pretrimming means for reducing the thickness of the layer of toner supplied to the sleeve means by the supply means upon rotation of the sleeve means, said layer of toner being reduced by said pretrimming means to a first selected thickness; and

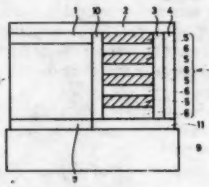
restriction member means braced against the surface of the sleeve means for frictionally charging the toner particles on the surface, and for further reducing the thickness of the toner layer to a second selected thickness of predetermined value less than said first selected thickness for transfer to the carrier.

4,799,087

FIELD EFFECT TRANSISTOR

Takao Matsuyama; Hisaki Tarui, both of Hirakata; Shinya Tsuda, Yawata; Shoichi Nakano, Hirakata, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 10, 1987, Ser. No. 72,180
Claims priority, application Japan, Jul. 22, 1986, 61-172087
Int. Cl.[4] H01L 27/12
U.S. Cl. 357—4 5 Claims



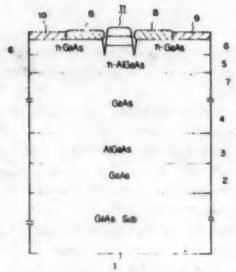
1. A field effect transistor comprising:
a source electrode,
a drain electrode,
a channel layer between said source electrode and said drain electrode,
a gate electrode for controlling electric current in said channel layer, and
a superlattice layer between said channel layer and said gate electrode, said superlattice layer including a plurality of constituent thin layers perpendicular to a direction of electric current in said channel layer.

4,799,088

HIGH ELECTRON MOBILITY SINGLE HETEROJUNCTION SEMICONDUCTOR DEVICES AND METHODS FOR PRODUCTION THEREOF

Satoshi Hiyamizu, Tokoyo, and Toshio Fujii, Kanagawa, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 27, 1981, Ser. No. 286,863
Claims priority, application Japan, Jul. 28, 1980, 55-103422
Int. Cl.[4] H01G 29/161
U.S. Cl. 357—16 10 Claims



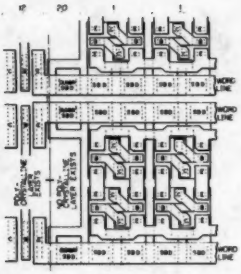
1. A high electron mobility heterojunction semiconductor device comprising:
a semi-insulating GaAs substrate;
an undoped AlGaAs layer grown on the semi-insulating GaAs substrate;
a GaAs layer grown on said undoped AlGaAs layer, said GaAs layer having a low N-type impurity concentration;
a N-type AlGaAs layer grown on said GaAs layer, and defining a heterojunction between said GaAs layer and said N-type AlGaAs layer;
at least one gate electrode formed on said N-type AlGaAS layer; and
a pair of source and drain electrodes arranged flanking said at least one gate electrode.

4,799,089

SEMICONDUCTOR MEMORY DEVICE

Hiroyuki Fukuma, and Masashi Sato, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 798,282, Nov. 15, 1985, abandoned.
This application Feb. 4, 1988, Ser. No. 159,417
Claims priority, application Japan, Nov. 20, 1984, 59-243304
Int. Cl.[4] H01L 27/10, 27/15
U.S. Cl. 357—45 7 Claims



4. A semiconductor memory cell device comprising:
a semiconductor substrate;
a plurality of bit lines;
a plurality of memory cells provided on a surface of said semiconductor substrate and separated from each other by an isolation region and connected to said plurality of bit lines, each of said memory cells including a transistor region and a load region, transistors in said transistor region being connected to said bit lines;
word drivers provided on the surface of said semiconductor substrate in a portion of the region in which said memory cells are formed;
word line layers, formed on the surface of said semiconductor substrate and extending along said load region, each of said word line layers connected to said respective word drivers and connected to said load region for forming Schottky barrier diodes; and
dummy Schottky barrier diode regions, provided between each of said memory cells and said word drivers, and operatively connected to said word line layers, for forming dummy Schottky barrier diodes for limiting a forward voltage of said Schottky barrier diodes in said load region.

4,799,090

TUNNEL INJECTION CONTROLLING TYPE SEMICONDUCTOR DEVICE CONTROLLED BY STATIC INDUCTION EFFECT

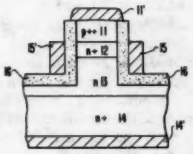
Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Filed Oct. 23, 1981, Ser. No. 314,496
Claims priority, application Japan, Oct. 28, 1980, 55-151849
Int. Cl.[4] H01L 29/88, 29/36, 29/20
U.S. Cl. 357—12 27 Claims

1. A tunnel injection controlling type semiconductor device, comprising:
a highly-doped source semiconductor region having a first conductivity type for supplying carriers;
a highly-doped drain semiconductor region having a second

conductivity type opposite to said first conductivity type for receiving said carriers;

a channel semiconductor region having said second conductivity type disposed between said source region and said drain region in which the portion adjacent to said source



region is highly-doped and the carrier concentration of the remaining part is lower than in said highly-doped portion of said channel region; and

a gate provided on said device for controlling tunnel current flow from said source region to said drain region.

4,799,091

QUANTUM DEVICE OUTPUT SWITCH

Mark A. Reed, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 626,806, Jul. 2, 1984, Pat. No. 4,581,621. This application Apr. 4, 1986, Ser. No. 848,674

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.[4] H01L *29/225, 29/76, 29/88*

U.S. Cl. 357—12 **7 Claims**

1. An electronic device comprising:

a plurality of quantum wells positioned and connected to embody a desired circuit function with tunneling barriers between adjacent ones of said wells;

a set of at least one trapping site, all of said at least one trapping sites within tunneling distance of an adjacent trapping site (if any) and a first of said at least one trapping sites within tunneling distance of one of said wells;

a high conductivity region passing near one of said at least one trapping sites and having cross-sectional dimensions thereat that confine carriers moving along said high conductivity region to the scattering range of a carrier confined to said one of said at least one trapping sites; and

a resistance sensor connected to said high conductivity region;

whereby the presence or absence of a carrier trapped in said one of said at least one trapping sites is detected by said resistance sensor as a change in the resistance of said high conductivity region.

4,799,092

INTEGRATED CIRCUIT COMPRISING COMPLEMENTARY FIELD EFFECT TRANSISTORS

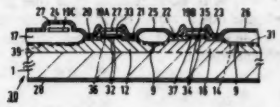
Francois M. Klaassen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 052,129, May 1, 1987, abandoned, which is a continuation of Ser. No. 656,623, Oct. 1, 1984, abandoned. This application Nov. 5, 1987, Ser. No. 119,291

Claims priority, application Netherlands, Oct. 7, 1983, 8303441

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.12 **8 Claims**



1. An integrated circuit comprising a semiconductor body having a major surface, plural circuit elements located at said surface, the semiconductor body comprising, near the major surface, a first substrate region of a first conductivity type and a second substrate region of a second conductivity type, at least a first field effect transistor, the first substrate region comprising a source and a drain zone of the second conductivity type of said at least first field effect transistor, a first insulating layer, a first channel region extending between said source and drain zones and at the major surface being covered by said first insulating layer, a first gate electrode comprising semiconductor material on said first insulating layer, at least a second field effect transistor, the second substrate region comprising a source and a drain zone of the first conductivity type of said at least second field effect transistor, a second insulating layer, a second channel region extending between said source and drain zones and at the major surface being covered by said second insulating layer, and a second gate electrode comprising semiconductor material on said second insulating layer, the semiconductor material of the first gate electrode and the semiconductor material of the second gate electrode being of opposite conductivity types to each other, a thin surface layer in each of the first and second channel regions, located between and adjoining said source and drain zones and adjoining the insulating layer, which surface layers are each of the same conductivity type as the adjoining source and drain zones, the maximum doping level of said thin surface layers being sufficiently low such that said first and second field effect transistors are both of the normally-off depletion type, the minimum doping level per unit surface area in each of the thin surface layers being at least equal to the quantity of charge per unit surface area in the part of the channel region which is depleted if a voltage equal to the threshold voltage of the associated field effect transistor is applied to the associated gate electrode with respect to the source and drain zones of said associated field effect transistor and which adjoins the surface layer.

4,799,093

SEMICONDUCTOR MEMORY DEVICE HAVING A MOS TRANSISTOR AND SUPERPOSED CAPACITOR

Masanobu Kohara, and Hiroshi Shibata, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 313,248, Oct. 21, 1981. This application May 22, 1984, Ser. No. 611,929

Claims priority, application Japan, Jan. 17, 1981, 56-6607

Int. Cl.[4] H01L *29/78, 27/02, 29/34, 23/48*

U.S. Cl. 357—23.6 **5 Claims**

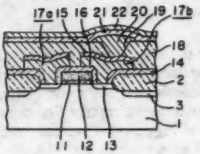
1. A semiconductor memory device comprising:

a semiconductor substate of a first conductivity type having a surface;

an MOS transistor formed on said surface including a gate of

a thin oxide layer formed on said surface as polysilicon gate electrode located on said gate, source and drain regions of high impurity concentrations of a second conductivity type located within said surface, a first oxide layer located over said source region, said drain regions, said gate and said gate electrode, said first oxide layer having a contact hole over each of said source region and said drain region, a source electrode and a drain electrode being located on said first oxide layer and through said contact holes in electrical communication with said source and drain regions, respectively;

a second oxide layer located on said first oxide layer, said source electrode and said drain electrode, and having a through-hole with slanted sides over one of said source electrode and said drain electrode, said second oxide layer having a thickness of 2 μm or more so as to diminish a floating capacitance;



a first conductive layer connected to one of said source electrode and said drain electrode through said through-hole and extending on the surface of said second oxide layer so that the area of said first conductive layer on said surface of said second oxide layer is larger than the area of said first conductive layer where it contacts said one of said source electrode and said drain electrode;

a dielectric layer formed on the surface of said first conductive layer and on the surface of said second oxide layer;

a second conductive layer formed on said dielectric layer and over the area covered by said first conductive layer;

wherein said first conductive layer, said dielectric layer and said second conductive layer form a capacitor; and

wherein said capacitor is located at least partially above said MOS transistor.

4,799,094

LARGE-FORMAT PHOTOSENSITIVE DEVICE AND A METHOD OF UTILIZATION

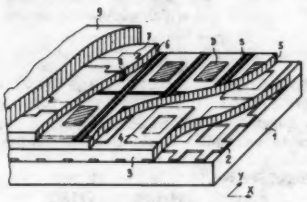
Henri Rougeot, St. Nazaire Les Eymes, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 16, 1985, Ser. No. 809,508

Claims priority, application France, Dec. 27, 1984, 84 19919

Int. Cl.[4] H01L *27/14*

U.S. Cl. 357—30 **15 Claims**



1. A large-format photosensitive device, wherein said device comprises:

a semiconductor substrate of n-doped hydrogenated amorphous silicon, said substrate having a first face and a second face;

the first face of said semiconductor substrate supporting in turn the following superposed elements:

a first array of conductive pads of substantially rectangular shape with a central opening, which are arranged in rows and columns, said pads being formed of material which forms a rectifying junction with the semiconductor substrate for serving as a floating grid;

a layer of insulating material; and

a conductive network capacitively coupled to the conductive pads for forming a control grid;

the second face of said semiconductor substrate supporting in turn the following superposed elements:

a second array of conductive pads serving as drains which are located opposite the central openings of the first array of conductive pads and and a plurality of ladder-shaped electrodes serving as sources which circumscribe the drains and are disposed in columns; and

connections between the drains of a common row of all the columns of the array.

4,799,095

METAL OXIDE SEMICONDUCTOR GATED TURN OFF THYRISTOR

Bantval J. Baliga, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1987, Ser. No. 69,806

Int. Cl.[4] H01L *29/74, 29/78, 29/06, 27/02*

U.S. Cl. 357—38 **25 Claims**

1. In a thyristor containing therein a plurality of semiconductor regions forming two, merged, but separately identifiable bipolar transistors, the collector of one transistor being coupled to the base of the second transistor and the base of the one transistor being coupled to the collector of the second transistor, the improvement comprising:

insulated gate means coupled to the base of one of said two bipolar transistors for interrupting the current path in the base of said one of said two bipolar transistors.

4,799,096

MONOLITHIC INTEGRATED CIRCUIT COMPRISING CIRCUIT BRANCHES PARALLEL TO ONE ANOTHER

Siegmar Koeppe, Laatzen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 3, 1987, Ser. No. 56,882

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1986, 3619064

Int. Cl.[4] H01L *27/02, 27/10, 29/78*

U.S. Cl. 357—42 **5 Claims**

1. A monolithic integrated circuit comprising:

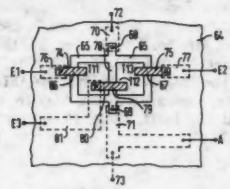
first and second circuit points;

at least two circuit branches extending parallel to one another between and connected to said first and second circuit points and each comprising a field effect transistor including a source, a drain and a gate;

each of said branches including self-contained, strip-shaped connecting zones each of which is interrupted only in the channel regions of said field effect transistors; and

a further strip-shaped connecting zone connected between

said first and second circuit points and including a further field effect transistor including a source, a drain and a



gate, said further strip-shaped connecting zone interrupted only in the channel region of said further field effect transistor.

4,799,097

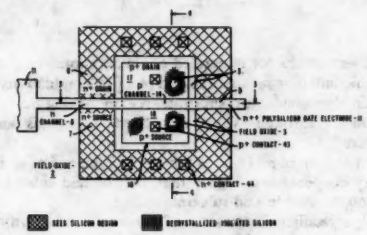
CMOS INTEGRATED DEVICES IN SEEDED ISLANDS

Nicholas J. Sziuk, and Jay T. Fukumoto, both of Albuquerque, N. Mex., assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 29, 1987, Ser. No. 78,959

Int. Cl.[4] H01L *29/78, 27/02, 29/04*

U.S. Cl. 357—42 **8 Claims**



1. An integrated circuit structure having a first and second dielectrically separate field effect transistors on a common substrate, comprising:

a field dielectric region in the substrate;

a first active region of monocrystalline semiconductor substrate concentrially disposed about the dielectric region;

a second active region of recrystallized semiconductor disposed over the dielectric region; and

a gate electrode extending over the first and the second active regions to define within such first and second active regions respective first and second channel regions, and respective first and second source/drain regions bordering the first and second channel regions.

4,799,098

MOS/BIPOLAR DEVICE WITH STEPPED BURIED LAYER UNDER ACTIVE REGIONS

Takahide Ikeda, Tokorozawa; Atsuo Watanabe, Hitachiohta; Touji Mukai, Sanda; Masanori Odaka, Kodaira, and Katsumi Ogiue, Hinode, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 682,004, filed as PCT JP84/00133 on Mar. 26, 1984, published as WO84/03996 on Oct. 11, 1984, abandoned.

This application Apr. 10, 1987, Ser. No. 37,123

Claims priority, application Japan, Mar. 26, 1983, 58-53077

Int. Cl.[4] H01L *27/02*

U.S. Cl. 357—43 **14 Claims**

1. A semiconductor device comprising:

a semiconductor substrate having a major surface, and comprising a semiconductor body having an N-type semiconductor epitaxial layer thereon, said epitaxial layer having a relatively low impurity concentration, a surface of the epitaxial layer forming the major surface;

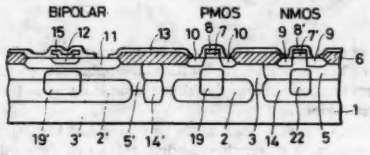
a vertical type NPN bipolar transistor formed in said epitaxial layer, said vertical type NPN bipolar transistor including a base, an emitter and a collector;

a P-channel MOS field-effect transistor formed in the epitaxial layer and adjacent to said vertical type NPN bipolar transistor, said P-channel MOS field-effect transistor including a source, a drain and a gate;

an N-channel MOS field-effect transistor formed in a P-type well of a low impurity concentration provided adjacent to said P-channel MOS field-effect transistor, said N-channel MOS field-effect transistor including a source, a drain and a gate;

first N-type buried layers, each having a relatively high impurity concentration, respectively formed in said semiconductor substrate under the base of said vertical type NPN bipolar transistor, and spaced from said base by a portion of the epitaxial layer, and formed under the P-channel MOS field-effect transistor, and spaced therefrom by a portion of the epitaxial layer;

a first P-type buried layer, having a relatively high impurity



concentration, formed in said semiconductor substrate under said N-channel MOS field-effect transistor and adjacent to said P-type well; and

second N-type buried layers, each having a relatively high impurity concentration, respectively formed in said semiconductor substrate under said emitter of said vertical type NPN bipolar transistor, and under the gate, and below the source and drain, of said P-channel MOS field-effect transistor, overlapping respectively in part with said first N-type buried layers and facing respectively to the emitter of said vertical type NPN bipolar transistor and the gate of said P-channel MOS field-effect transistor, the second N-type buried layers having a portion of the epitaxial layer between the respective second N-type buried layer and the base of the vertical type NPN bipolar transistor and the P-channel MOS field-effect transistor, the respective depth to said second N-type buried layers from the major surface of said semiconductor substrate being shallower than the depth to said first N-type buried layers from the major surface of said semiconductor substrate.

4,799,099

BIPOLAR TRANSISTOR IN ISOLATION WELL WITH ANGLED CORNERS

Douglas P. Verret, Sugar Land; Jeffrey E. Brighton, Houston; Deems R. Hollingsworth, Missouri City, and Manuel L. Torreno, Jr., Harris, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 824,388, Jan. 30, 1986, abandoned. This application Nov. 19, 1986, Ser. No. 932,752

Int. Cl.[4] H01L *27/04, 29/70, 29/46*

U.S. Cl. 357—50 **19 Claims**

1. A bipolar transistor formed on a face of a semiconductor body, comprising:

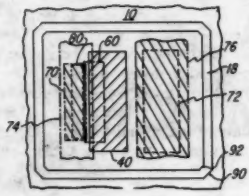
local isolation formed at said face to define spaced apart emitter-base and collector contact areas for said transistor, an extrinsic base region doped with impurity of a first conductivity type formed in a portion of said emitter-base area;

a conductive base contact layer formed over said local isolation and contacting said extrinsic base region, said base contact layer doped with the same impurity as the extrin-

sic base region and having a non-conductive spacer formed over a sidewall thereof to overlap said emitter-base area;

an intrinsic base region in said emitter-base area contiguous to said extrinsic base region;

an emitter region doped with impurity of a second conductivity type formed within said intrinsic base region, said emitter region having an edge adjacent to said extrinsic base region and aligned with an edge of said spacer;



an emitter contact to said emitter region and separated from the base contact layer by the non-conductive spaces, said emitter contact doped with the same impurity as the emitter region; and

isolation means at least partly enclosing said transistor, and comprising a trench extending from said face into the semiconductor body, said trench, viewed in plan, having corners which are angled so that the trench has a substantially constant width.

4,799,100

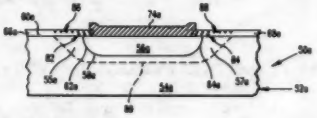
METHOD AND APPARATUS FOR INCREASING BREAKDOWN OF A PLANAR JUNCTION

Richard A. Blanchard, Los Altos, and Adrian I. Cogan, San Jose, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Filed Feb. 17, 1987, Ser. No. 14,961

Int. Cl.[4] H01L 29/12, 29/40

U.S. Cl. 357—52 **23 Claims**



1. A semiconductor device comprising a substrate having a region of first conductivity type and a region of second conductivity type, together forming a junction which extends to a surface of the substrate;

an oxide layer portion on the surface of the substrate and covering the junction at the surface; and

a charged ion region in said oxide layer extending generally from adjacent to the junction at the surface of the substrate over a portion of the region of first conductivity type, the polarity of the ions in said ion region being the same as the polarity of the region of first conductivity type, wherein the charged ion region in said oxide layer is of greater concentration in a first portion thereof than in a second portion thereof.

4,799,101

SUBSTRATE BIAS THROUGH POLYSILICON LINE

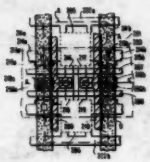
Hirotugu Eguchi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 689,886, Jan. 9, 1985, which is a continuation of Ser. No. 579,283, Feb. 14, 1984, which is a continuation of Ser. No. 265,003, May 20, 1981. This application Dec. 23, 1986, Ser. No. 946,151

Claims priority, application Japan, May 16, 1980, 55-64752

Int. Cl.[4] H01L 29/46, 29/66, 29/90

U.S. Cl. 357—59 **3 Claims**



1. A semiconductor integrated circuit, comprising:

a semiconductor substrate region of a first conductivity type said semiconductor substrate region having no ohmic contact through which any fixed voltage is applied thereto,

a first region, of said first conductivity type and of an impurity concentration higher than that of said substrate region, formed in said substrate region,

a polycrystalline silicon layer of a second conductivity type directly contacted to a surface of said first region with a reverse biased PN junction therebetween, and

means for supplying said polycrystalline silicon layer with a predetermined voltage to thereby continuously maintain said substrate region at said predetermined voltage through a leakage path of said reverse biased PN junction.

4,799,102

DIGITAL COLOR DEMODULATOR

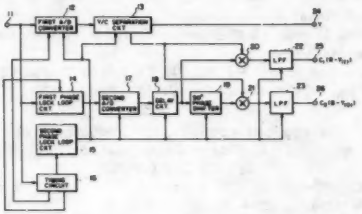
Reiichi Kobayashi, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed Aug. 26, 1987, Ser. No. 89,392

Claims priority, application Japan, Aug. 26, 1986, 61-199393; Oct. 7, 1986, 61-153214

Int. Cl.[4] H04N 9/64

U.S. Cl. 358—23 **15 Claims**



1. A demodulator for a color composite video signal comprising:

means, receiving an analog composite video signal, for gen-

erating an internal system clock, phase-locked to a horizontal period of said analog composite video signal;

means, receiving said analog composite video signal, and synchronized to said internal system clock, for generating a digital luminance signal and a digital color signal modulated by a color subcarrier signal from the analog composite video signal;

means, receiving the analog composite video signal, synchronized to said internal system clock, for generating a digital subcarrier signal directly from the analog composite video signal; and

means, synchronized to said internal system clock, for orthogonally demodulating color difference signals based on said digital subcarrier signal and said digital color signal

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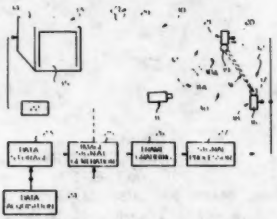
4,799,103

THREE-DIMENSIONAL LASER DRIVEN DISPLAY APPARATUS

Myron C. Muckerheide, Port Washington, Wis., assignor to Seton Health Care Foundation, Milwaukee, Wis.

Filed Oct. 10, 1986, Ser. No. 917,493
Int. Cl.[4] H04N *13/02*
U.S. Cl. 358—88 **24 Claims**



1. A three-dimensional laser driven display apparatus for the controlled projection, display and manipulation of laser generated images towards the creation of a three dimensional display, said three-dimensional display apparatus comprising:

image signal generation means for producing image control signals which correspond to said laser generated image to be displayed;

raster generation means operably and electrically connected to said image signal generation means, said raster generation means operating as a function of said image control signals produced by said image signal generation means to cause said laser generated image to be spatially encoded, said raster generation means thereby reflecting said spatially encoded laser generated image in a raster scanned pattern towards the formation of said complete three-dimensional display;

laser means for generating a coherent beam of light which is projected upon said raster generation means and reflected by said raster generation means towards the formation of said three-dimensional display;

varifocal mirror means upon which said spatially encoded laser generated image is reflected after being reflected by said raster generation means, said varifocal mirror means serving to, in turn, reflect and project said three-dimensional display such that said three-dimensional display is viewable in space standing off of the surface of said varifocal mirror means,

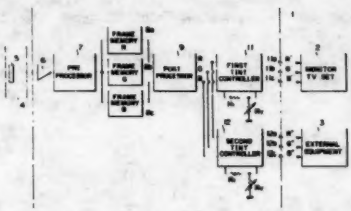
said varifocal mirror means including a reflective plate means and a motion control means where said reflective plate means is moved about an axis perpendicular to the plane formed by said reflective plate means, the movement of said reflective plate means being controlled by said motion control means such that said reflective plate means sweeps out an image space whereby said spatially encoded laser generated image projected thereon appears in successive planes as a function of the position of said reflective plate means at each instant in time thus spatially decoding said spatially encoded laser generated image to create said three-dimensional display.

4,799,104

VIDEO SIGNAL PROCESSOR FOR ENDOSCOPE

Takamasa Hosoya, Hachioji, and Kenji Kimura, Tachikawa, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Dec. 14, 1987, Ser. No. 132,151
Claims priority, application Japan, Dec. 19, 1986, 61-303214; Dec. 22, 1986, 61-305691; Oct. 22, 1987, 62-267348
Int. Cl.[4] A61B *1/04, 1/06*; H04N *7/18*
U.S. Cl. 358—98 **15 Claims**



1. A video signal processor for endoscope comprising

means for converting a picture signal of an image being observed such as that of a coeloma into a television video signal;

output means in at least two systems for delivering the television video signal from the converting means;

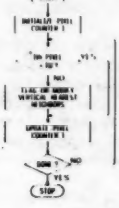
and tint controlling means for allowing the tint of the television video signal of at least one system to be controlled either internally or externally and independently from the tint of the other system.

4,799,105

MODIFIED TECHNIQUE FOR SUPPRESSION OF FLICKER IN INTERLACED VIDEO IMAGES

Joan L. Mitchell, Ossining, and William B. Pennebaker, Carmel, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 589,603, Mar. 14, 1984, abandoned. This application Sep. 16, 1987, Ser. No. 97,371
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—160 **12 Claims**



1. A method for suppressing the perception of flicker in interlaced video images, comprising the steps of:

testing, each pixel in an image, for an intensity value;

comparing said intensity values to a first predetermined threshold value;

modifying, for only those tested pixels with an intensity value below said first predetermined threshold value, and intensity value representation for each nearest neighbor

pixel along a first axis of said interlaced image having an intensity value exceeding a second predetermined threshold value greater than said first predetermined threshold value; and

displaying, on a video display device, an interlaced image generated by said steps of testing, comparing, and modifying, having a suppressed perception of flicker.

4,799,106

CONTROLLING IMAGE SIGNALS IN AN IMAGING APPARATUS

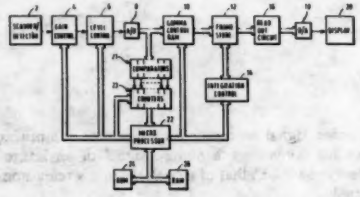
William T. Moore, Buckhurst Hill, and Kenneth J. Wallace, Woodford Green, both of United Kingdom, assignors to Rank Pullin Controls Limited, Loughton, England

Filed Aug. 19, 1986, Ser. No. 897,858

Claims priority, application United Kingdom, Aug. 22, 1985, 8521019

Int. Cl.[4] H04N *5/235, 5/57*

U.S. Cl. 358—168 **18 Claims**



1. Imaging apparatus comprising:

means for producing electrical image signals of a given level representing a brightness for each of a number of pixels in a scene;

means for controlling the level of said signals;

digital means for determining if there is a difference between the number of said pixels in a high brightness band and the number thereof in a low brightness band; and

feedback means responsive to said difference for adjusting said level control means at least to reduce said difference.

4,799,107

AUXILIARY GAIN CONTROL APPARATUS FOR A TELEVISION RECEIVER

John W. Stoughton, Indianapolis, and Charles B. Neal, Zionsville, both of Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 6, 1987, Ser. No. 34,444

Int. Cl.[4] H04N *5/208, 5/57*

U.S. Cl. 358—169 **6 Claims**

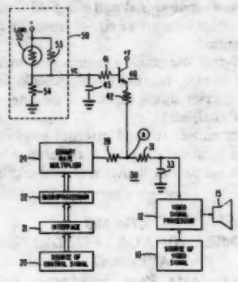
1. In a video signal processing system including an image display device having a viewing screen, apparatus comprising:

video signal processing means having a signal input for receiving a video signal, a control input for receiving a gain control signal to control the magnitude of said video signal, and an output coupled to said image display device;

translating means responsive to a clock timing signal and responsive to an input binary signal representative of a desired magnitude of said video signal, for providing at an output an output binary signal with a substantially constant amplitude and with a duty factor determined by said input binary signal, said duty factor representing a DC value of said output binary signal;

means for conveying a DC signal derived from said output binary signal to said control input of said video signal processing means;

ambient light responsive variable conduction means positioned with respect to said viewing screen such that substantially proportional amounts of ambient light strike said ambient light responsive means and said viewing screen; and



means for coupling said ambient light responsive means to said output of said translating means without influencing said input binary signal, for modifying said DC signal in response to ambient light conditions.

4,799,108

METHOD OF RECORDING AND STORING IMAGES IN RAPID SEQUENCE

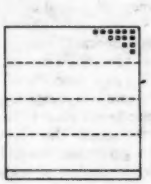
Rudolf Gerner, Berlin, Fed. Rep. of Germany, assignor to KAPPA messtechnik GmbH, Gleichen-Reinhausen, Fed. Rep. of Germany

Filed Aug. 19, 1987, Ser. No. 86,965

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628147

Int. Cl.[4] H04M *3/14*

U.S. Cl. 358—213.26 **6 Claims**



1. Method of recording and storing pictures in rapid sequence comprising the steps of: imaging the pictures by an optical system on a recording surface of a CCD picture recorded operating on the frame-transfer principle; transferring the imaged pictures in form of charge pictures into a memory of the CCD picture recorder; reading out the pictures from said memory line-by-line by a register; dividing the surface of the CCD picture recorder into a recording area and a memory area; subdividing the surface of the CCD picture recorder into a smaller subsidiary recording area and at least two subsidiary memory areas; transferring one picture in separate steps from said subsidiary recording area through said subsidiary memory areas in sequence and imaging every subsequent picture in the subsidiary recording area as said subsequent picture becomes free; and transferring said subsequent picture in separate steps to a respective subsidiary memory area as said subsequent picture becomes free until all the subsidiary areas of the CCD picture recorder are completely charged.

4,799,109

CHARGE COUPLED SENSOR ARRANGEMENT

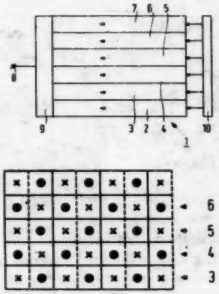
Leonard J. M. Esser, and Marcellinus J. M. Pelgrom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 824,029, Jan. 30, 1986, abandoned. This application Jan. 27, 1988, Ser. No. 149,981

Claims priority, application Netherlands, Feb. 7, 1985, 8500337

Int. Cl.[4] H04N 3/14

U.S. Cl. 358—213.28 5 Claims



1. A charge coupled line transfer image sensor having improved resolution comprising:

a semiconductor body;

a plurality of adjacent parallel charge coupled devices formed at a surface of said body, each device of said plurality of devices forming a line of spaced-apart photosensitive elements;

a plurality of electrodes, each electrode associated with one of n-phases at a time, each photo-sensitive element lying at least partially under electrodes associated with a first phase and another phase;

means for selectively biasing the electrodes associated with said first phase during recording of a radiation image in a first mode selectively to create potential barriers in the body under said electrodes associated with the first phase between adjacent photo-sensitive elements in said line or in a second mode to create potential barriers in the body between said electrodes associated with said first phase whereby adjacent photosensitive elements can be selectively laterally shifted to improve the resolution of the image sensor.

4,799,110

IMAGE SIGNAL CODING APPARATUS

Katsutoshi Hisada; Nobuaki Kokubu, both of Tokyo; Shigeki Sakurai, Yokohama; Yukio Murata, Kawasaki, and Tatsuo Okano, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1986, Ser. No. 888,493

Claims priority, application Japan, Aug. 2, 1985, 60-170803; Aug. 2, 1985, 60-170804; Aug. 2, 1985, 60-170805; Aug. 2, 1985, 60-170806; Aug. 2, 1985, 60-170807; Aug. 2, 1985, 60-170808; Aug. 2, 1985, 60-170809; Aug. 2, 1985, 60-170810

Int. Cl.[4] H04N 1/40

U.S. Cl. 358—261.3 45 Claims

1. An image signal coding apparatus comprising:

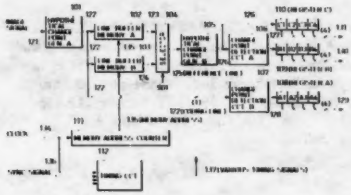
receiving means for receiving a serial reference line image signal in synchronism with a serial coding line image signal;

first converting means for inputting serial change point data representing a change point in the reference line image signal received by said receiving means and outputting parallel reference line change point data;

second converting means for receiving serial change point data representing a change point in the coding line image signal and outputting parallel coding line change point data;

means for monitoring output states of said first and second converting means;

means for counting the number of pixels between the change points in the coding line image signal; and



coding means for coding the coding line image signal in response to outputs from said monitoring means and said counting means.

4,799,111

VIDEO SIGNAL RECORDING AND/OR REPRODUCING APPARATUS WITH A FUNCTION FOR RE-RECORDING A SEARCH CONTROL-INDEX SIGNAL

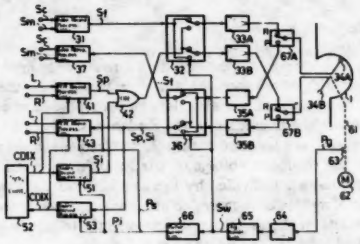
Yuji Ito, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 112,513

Claims priority, application Japan, Oct. 27, 1986, 61-254968

Int. Cl.[4] H04N 5/782; G11B 27/30

U.S. Cl. 360—14.3 6 Claims



1. An apparatus for recording and/or reproducing, in successive slant tracks on a record tape, an information signal comprised of at least an audio signal and an index signal for use in controlling transportation of the tape, comprising:

audio signal processing means for converting an input audio signal to a digitized form in which the audio data for a predetermined length of time is grouped as a plurality of data blocks;

transducer means scanning said successive slant tracks and being connected to said audio signal processing means for recording and/or reproducing said grouped data blocks containing the digitized audio signal for said predetermined length of time in a first part of a respective slant track on the tape;

index signal generating means including means for generating a coded index signal to indicate respective input information;

index area signal generating means for providing an index area signal in predetermined timed relation to said scanning by said transducer means of said first part of each said slant track;

switching means responsive to said index area signal for supplying said coded index signal to said transducer means for recording by the latter in a second part of said respec-

tive slant track which is located adjacent an end of said first part of said respective slant track; and

start code and end code generating means for inserting a predetermined coded pattern into a starting area and an ending area of said coded index signal recorded in said second part of said respective slant track.

4,799,112

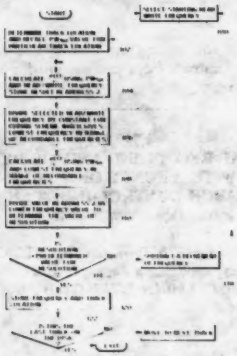
METHOD AND APPARATUS FOR RECORDING DATA

Robert A. Bremmer; Vladimir Kovner, both of Oklahoma City, Okla., and Dennis C. Stone, Simi Valley, Calif., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Feb. 19, 1987, Ser. No. 16,166

Int. Cl.[4] G11B *27/36, 5/09*

U.S. Cl. 360—31 **27 Claims**



1. A data storage device including a read/write head and a magnetic disk which form the disk to head interface, the magnetic disk capable of retaining data pulses recorded at various frequencies, the amplitude of the readback voltage of a pulse train varying as a function of the selected frequency, the amplitude of the readback voltage of a pulse train recorded at the selected frequency divided by the amplitude of the readback voltage of a pulse train recorded at a lower frequency yielding the resolution, the magnetic system manufactured with disks formatted by a process comprising the steps of:

determining a magnetic characteristic for the head to disk interface for each track on the magnetic disk; and

using the determined magnetic characteristic for each track to select a frequency for each track that will produce a substantially constant resolution in each track across the disk.

4,799,113

APPARATUS FOR PROCESSING DIGITAL DATA

Yoshihiro Murakami, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 92,542

Claims priority, application Japan, Sep. 5, 1986, 61-209143

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—32 **10 Claims**

1. An apparatus for processing digital data comprising:

input circuit means for providing an input digital signal including word data and write addresses associated with respective words of said word data;

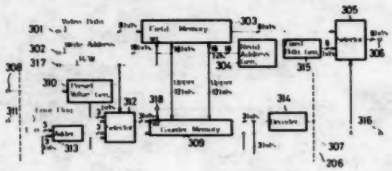
memory means connected to said input circuit means for storing said words of said word data from said input circuit means according to said respective write addresses;

read address generating means for generating read addresses and being connected with said memory means for reading out the stored words from the respective addresses of said memory means;

output circuit means for deriving an output signal;

word data generating means for generating word data having a predetermined pattern;

switching means connected to said memory means, said output circuit means and said word data generating means for selectively providing, as said output signal, the stored words which are read out from said memory means or said



word data having said predetermined pattern from said word data generating means; and

control means supplied with said write and read addresses for controlling said switching means to provide said output circuit means with said word data having said predetermined pattern from said word data generating means as said output signal instead of said stored words read out of said memory means when a stored word being read out has been read out of said memory means a predetermined multiple number of times.

4,799,114

THERMOMAGNETIC RECORDING CARRIER AND A METHOD FOR THERMOMAGNETIC RECORDING

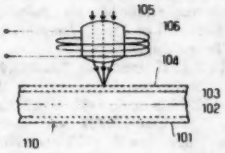
Shigeru Tsunashima, Nagoya, Japan, assignor to Daidotokushuko Kabushiki Kaisha and Canon Kabushiki Kaisha, both of, Japan

Continuation of Ser. No. 908,934, Sep. 15, 1986, abandoned, which is a continuation of Ser. No. 644,143, Aug. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 315,467, Oct. 27, 1981, abandoned. This application May 15, 1987, Ser. No. 51,163

Claims priority, application Japan, Nov. 1, 1980, 55-154291

Int. Cl.[4] G11B *5/02*

U.S. Cl. 360—59 **8 Claims**



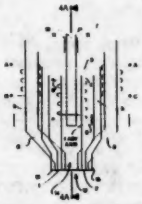
1. A thermomagnetically recordable and magneto-optically readable recording carrier comprising; a substrate; first and second layers being disposed on said substrate, said first layer possessing a higher coercive force and a lower Curie point relative to said second layer, at least said first layer possessing perpendicular magnetic anisotropy; and said first layer and said second layer being formed of amorphous alloys of lanthanide-transition metals, and said first layer and said second layer being exchangeably combined.

4,799,115

METHOD AND APPARATUS FOR TOLERATING TRACK MISREGISTRATION SYSTEMS IN TWIN TRACK VERTICAL RECORDING SYSTEMS

Lee S. Rogers, Raleigh, and Albert W. Vinal, Cary, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 27, 1986, Ser. No. 923,778
Int. Cl.[4] G11B *5/024, 5/265*
U.S. Cl. 360—66 2 Claims



1. An improved twin track magnetic data read-write head apparatus, comprising:

a twin track magnetic writing structure having two magnetically linked and magnetically permeable flux conductive legs, said legs being provided with a means of magnetic flux energization for writing data on a magnetic recording medium;

portions of said legs being positioned adjacent to said medium to magnetically write thereon, said portions of said legs having projected areas of exposure adjacent said medium which lie in two parallel recording paths on said medium, each said area having its longest dimension arranged colinear with the other and perpendicular to the longest axis of the desired recording path on said medium; and

an E-shaped magnetically permeable erase member having means for energizing said member with magnetic flux to generate erasure of said medium;

said E-shaped member being mounted in electrical and magnetic isolation from said magnetic writing structure and mounted commonly therewith to precede said magnetic writing structure along said recording paths on said medium, said E-shaped magnetically permeable member being arranged to have projections of its leg areas upon said magnetic medium lying adjacent to each side of each of said recording paths thereon.

4,799,116

APPARATUS FOR CONTROLLING AN AUTO-REVERSE TAPE RECORDER HAVING A MODE-CHANGING MECHANISM

Mitsuru Ida, Saitama, and Noriyuki Koga, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 3, 1986, Ser. No. 903,293
Claims priority, application Japan, Sep. 9, 1985, 60-199258; Oct. 14, 1985, 60-228187
Int. Cl.[4] G11B *15/44*
U.S. Cl. 360—74.1 24 Claims

1. An auto-reverse type tape recording apparatus, comprising:

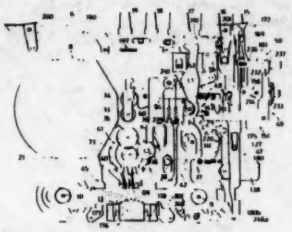
a changeover mechanism for selectively changing the travel of a tape from a normal run to a reverse run by operation of changeover means;

a mechanism for detecting an end of the tape;

a shut-off mechanism for shutting off said travel of the tape at a tape end;

a mode changing mechanism for changing over an operating mode from a shut-off mode, in which said travel of the tape is shut off as soon as said tape end is detected after a normal run or after a reverse run or after a reverse run following a normal run, to a repeat mode, in which said travel of the tape is repeatedly performed from normal run to reverse run under the working of said shut-off mechanism; and

switch means including an operating lever, a mode changeover lever, and a manual changeover rod, wherein said



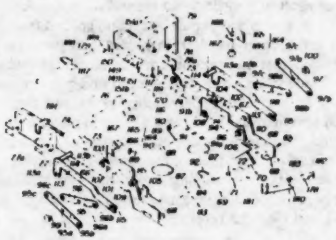
mode changeover lever is moved by operation of said manual changeover rod and said operating lever is moved by operation of said mode changeover lever, so that said operating mode is changed over to a repeat mode by operation of said changeover means during the time that said mode changing mechanism is in said shut-off mode.

4,799,117

MAGNETIC TAPE CASSETTE LOADING SYSTEM IN RECORDING AND/OR REPRODUCING APPARATUS

Masao Ohyama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,282
Claims priority, application Japan, Jun. 7, 1985, 60-123697
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—96.5 25 Claims



1. A cassette loading system in a recording and/or reproducing apparatus for a magnetic tape cassette which has at least a sliding closure member openably closing a cut-out in a bottom surface of the cassette casing, which cassette loading system comprises:

cassette holding means for receiving and holding said magnetic tape cassette within a cassette receptacle defined therein, said cassette holding means being movable between an eject position, in which said cassette holding means can receive a cassette and allow a cassette to be removed, and a loading position at which cassette loading is completed; and

first means, associated with said cassette holding means, for moving said sliding closure member from a closed position to an open position in synchronism with movement of said cassette holding means from said eject position to said loading position.

4,799,118

THIN FILM MAGNETIC HEAD

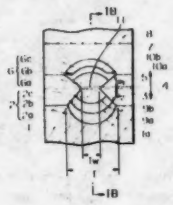
Masamichi Yamada; Masaaki Kurebayashi; Masakatsu Saito, all of Yokohama; Hitoshi Yanagihara, Kamakura; Katsuo Konishi, and Toshio Tsuchiya, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 918,338

Claims priority, application Japan, Oct. 14, 1985, 60-226748; Oct. 31, 1985, 60-242855

Int. Cl.[4] G11B *5/187, 5/31, 5/127*

U.S. Cl. 360—125 12 Claims



1. A thin film magnetic head comprising a non-magnetic substrate, a first core member formed on said non-magnetic substrate, a gap material layer formed on said first core member, and a second core member formed on said gap material layer, said first and second core members constituting a magnetic path for magnetic flux with which information is read/written on a magnetic recording medium, said first core member, said gap material layer and said second core member having first ends constituting a recording medium engaging end of said magnetic head, a surface of each of said first and second core members which faces said gap material layer to define a gap of said magnetic head having a width, as measured on a first plane containing a surface of said recording medium engaging end of said magnetic head in a direction parallel to said gap material layer, which is smaller than a width of a surface of each of said first and second core members as measured on a second plane parallel with and spaced from said first plane in a direction parallel with said gap material layer, a width of said first and second core members, as measured on said first plane in a direction parallel to said gap material layer, increasing in a direction perpendicular to and farther away from said gap material layer, and a surface of each of said first and second core members opposite to said gap material facing surface of each of said first and second core members, at least on said first plane containing the surface of said recording medium engaging end of said magnetic head, being not parallel with said gap material layer.

4,799,119

FLEXIBLE CIRCUIT MAGNETIC CORE WINDING FOR A CORE MEMBER

Renato V. Rossi; Steven F. Starcke, both of Rochester, Minn., and David A. Swagel, Portland, Oreg., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 10, 1986, Ser. No. 905,438

Int. Cl.[4] G11B *5/17*

U.S. Cl. 360—123 9 Claims

1. A flexible magnetic core winding for an integrally formed core member having a window, comprising:

a strip of flexible insulating material;

a plurality of substantially parallel conductors having connector pads wherein said connector pads are formed in a plurality of rows to maximize the size of said connector pads and the distance between said connector pad;

a plurality of leads on said strip attached to said connector pads;

a plurality of lead pads on said strip attached to said plurality of leads, wherein said lead pads are substantially larger than said connector pads;

wherein said connector pads are originating pads add terminating pads each of said terminating pads contacting the originating pad at the next adjacent conductor to form a multi-turn winding when the ends of said strip are brought together and said contacted pads are electrically connected.

4,799,120

GUARD PANEL FOR TAPE CASSETTES AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

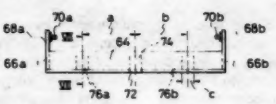
Yoshimi Sakai, and Yoshiki Satoh, both of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Sep. 23, 1985, Ser. No. 778,620

Claims priority, application Japan, Sep. 25, 1984, 59-144772[U]

Int. Cl.[4] G11B *23/02*

U.S. Cl. 360—132 13 Claims



1. A guard panel for a tape cassette having a housing, said guard panel being pivotally mounted on the housing and comprising:

an elongated plate member having a front plate portion, an upper plate portion and side plate portions forming side walls of said plate member, said front and upper plate portions together forming a substantially L-shaped transverse cross section with an outer front surface and an inner back surface when viewed in a transverse direction;

wherein said upper plate portion has at least two sections which differ in thickness from another section of said upper plate portion, said at least two sections being spaced apart from each other with a central region of said upper plate portion being situated between them in a longitudinal direction thereof; and

wherein said at least two sections of said upper plate portion which differ in thickness from another section of said upper plate portion are constituted by recesses formed only in said back surface of said upper plate portion and terminating at a point away from an outermost edge of said upper plate portion situated away from juncture of said upper and front plate portions in said substantially L-shaped configuration at said back surface thereof to thereby mitigate deformation and cracking of said guard panel.

4,799,121

DISK CARTRIDGE HAVING SHUTTERS MOVED BY A RACK AND PINION APPARATUS

Kenji Takahashi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 27, 1987, Ser. No. 42,733

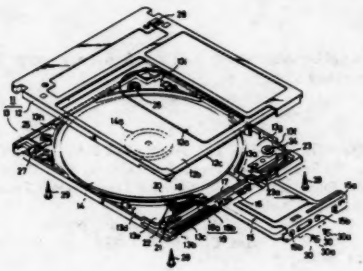
Claims priority, application Japan, Apr. 30, 1986, 61-100043

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 5 Claims

1. A disk cartridge comprising a pair of cartridge halves

forming said cartridge, at least one cartridge half having a window portion for exposing a part of a disk accommodated in said disk cartridge, a sliding shutter adapted to open and close said window portion, a sliding member slidably fitted to said one disk cartridge half and for supporting said sliding shutter for movement relative to said disk cartridge, a first rack provided on said sliding member, a second rack provided on a cartridge half and facing said first rack, a rotation axis body



having a step face and an engaging hole, a rotatable pinion being arranged on the axis body and supported by said step face in the axial direction, said pinion and body being positioned in the cartridge with the pinion being between said first rack and said second rack, and a torsion spring having one end engaged with said engaging hole and the other end being engaged with said cartridge half to urge the axis body and pinion along the second rack.

4,799,122

MOUNTING A DISC RECEIVER IN A DISC CARTRIDGE

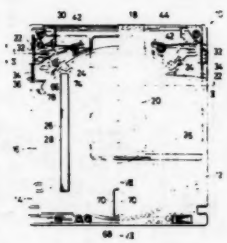
Kimio Tanaka, and Haruo Shiba, both of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Feb. 4, 1987, Ser. No. 10,896

Claims priority, application Japan, Feb. 10, 1986, 61-16790[U]

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 **11 Claims**



1. A disc cartridge, comprising:

a casing comprising an upper cover plate and a lower cover plate joined together to define a space in said casing;

a disc rotatably housed in said casing; at least one window provided in said casing to allow insertion of a disc driving element therethrough into said casing;

a shutter for operatively opening and closing said at least one window;

a pair of actuators arranged in said casing and engaged with said shutter to releasably lock said shutter;

a disc receiver arranged in said casing and operatively connected to at least one of said actuators to selectively receive therein a part of a peripheral portion of said disc;

a pivot pin on which said disc receiver is supported so as to be pivotally movable about said pivot pin, said pivot pin being mounted on one of inner surface of said upper and lower plates of said casing opposite to each other to inwardly project therefrom;

said pivot pin cooperating with the other of said inner surfaces to constantly form a gap in a thickness direction of said causing between said upper and lower plates which has a distance sufficient to ensure smooth movement of said disc receiver about said pivot pin;

wherein said gap is formed due to the engagement between a distal end of said pivot pin and said other inner surface of said casing.

4,799,123

DISC CARTRIDGE

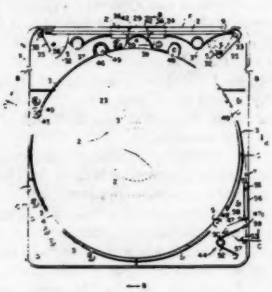
Yasunori Kanazawa, Hachioji; Haruo Arai, Mitsukaido, and Tadahiro Kuwa, Ibaragi, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 659,783, Oct. 11, 1984, abandoned. This application Jul. 14, 1987, Ser. No. 73,855

Claims priority, application Japan, Oct. 14, 1983, 59-192816

Int. Cl.[4] G11B *23/04, 5/012*

U.S. Cl. 360—133 **13 Claims**



1. A disc cartridge comprising:

a disc case formed by the combination of a top half and a bottom half each provided with peripheral walls, a drive shaft insertion hole and a head insertion window, each half having a closed chamber formed in between said top and bottom halves by partition walls of said respective halves;

a disc rotatably accommodated in said chamber of said disc case;

a shutter mechanism for opening and closing said drive shaft insertion hole and said head insertion window;

clamping means for operatively clamping said disc when said disc is not in use, said clamping means including stationary clamping members and a movable clamping member movable between a clamped position for clamping said disc in a clamped state by engagement of a part of said movable clamping member, together with said stationary clamping members, against said disc and a released position for releasing said disc from the clamped state into a released state by disengagement of said movable clamping member from said disc; and

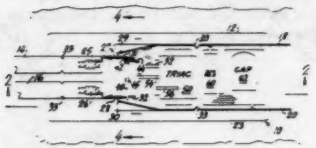
a slide slidably movable along a peripheral wall of said case, coupled with said movable clamping member so that clamping of said disc by said respective clamping members is operated by sliding of said slide independently of said shutter mechanism.

4,799,124

SHOCK HAZARD PROTECTOR FOR HAIR DRYERS

David C. Taylor, Patterson, N.Y.; William E. Springer, Fairfield, Conn.; Loretta Goeller, Rowayton, Conn., and Daniel Santhouse, Stratford, Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,598
Int. Cl.[4] H02H 5/04
U.S. Cl. 361—42 4 Claims



1. An apparatus which opens two AC power lines simultaneously, said power lines comprising part of a two-line AC power circuit providing electrical power to an appliance, said apparatus comprising:

a first substantially parallel pair of spaced electrically conductive contacts, each having a proximate fixed end for being placed into electrical contact with a respective one of said two power lines and a distal end;

a second pair of resilient elongated, electrically conductive contacts, each connected at one end to the electrical operating components of said appliance and each having a first end opposite said one end and adjacent said distal ends of said first pair of contacts, said first ends being normally biased away from each other and movable in the plane defined by said distal ends and spaced from each other outwardly of said distal ends;

an insulator secured adjacent said first end of one of said second pair of contacts;

an intermediate conductor secured to said insulator;

a single electrically conductive biasing fusible means connected to said intermediate conductor and to the other of said second pair of contacts for biasing both of said second pair of contacts toward each other to cause each of said first ends of said second pair of contacts to be in electrical contact with a respective one of said distal ends of said first pair of contacts, said fusible means normally not conducting current therethrough;

at least one sensor operatively associated with said appliance for sensing the presence of water within said appliance and for providing an indication thereof;

a triac having two output pins and a gate input pin, the gate input pin of said triac electrically connected to at least one of said sensors, one output pin of said triac electrically connected to said intermediate conductor, the other output pin of said triac electrically connected to one of said power lines, said triac causing, upon the occurrence of said indication from at least one of said sensors, current to be conducted through said fusible means to melt same.

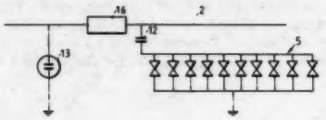
4,799,125

CIRCUIT PROTECTION ARRANGEMENT

David Crofts, Somerford Keynes, and Martin A. Wright, Swindon, both of England, assignors to Raychem Limited, Swindon, United Kingdom

Filed Sep. 3, 1987, Ser. No. 92,833
Claims priority, application United Kingdom, Sep. 5, 1986, 8621431
Int. Cl.[4] H02H 3/20
U.S. Cl. 361—91 17 Claims

1. An arrangement for protecting an electrical circuit from a voltage transient having a fast rise time, which comprises a plurality of semiconductor threshold foldback switching elements that are connected in parallel with one another between a current carrying line of the circuit and earth, and a further non-linear circuit protection device connected in parallel with



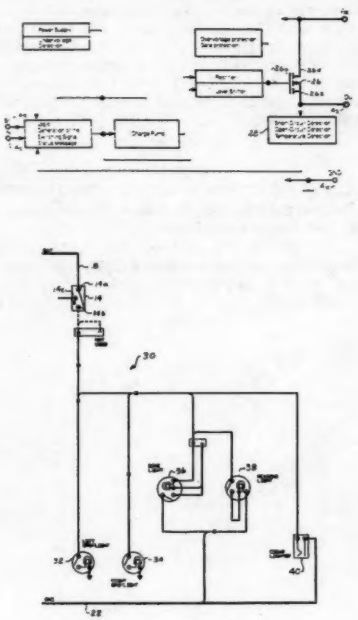
the switching elements to pass low frequency components of the transient to earth.

4,799,126

OVERLOAD PROTECTION FOR D.C. CIRCUITS

James W. Kruse, New Haven, Ind., and W. Eric Windle, Antwerp, Ohio, assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Apr. 16, 1987, Ser. No. 39,048
Int. Cl.[4] H02H 3/087
U.S. Cl. 361—101 24 Claims



1. In a D.C. electrical distribution system comprising a D.C. power supply and a branch connected across said power supply, said branch comprising an electrical load, a switch, conductors, and an overload protector all serially connected, said switch being selectively operable to selectively control the current flow through the branch, said overload protector serving to sense overload associated with the flow of current in the branch and interrupt the current flow upon sensing overload to thereby protect the branch against overload, the improvement which comprises said switch and said overload

protector being embodied in a solid state unit which comprises terminals via which it connects in the system, said unit comprising semiconductor structure which comprises a main controlled conduction path through the unit having a certain current/temperature rating and an associated overload protector for said main controlled conduction path responsive to incipient current or temperature exceeding said rating to protect said main controlled conduction path from potential damage, two of said terminals constituting external termination points for said main controlled conduction path via which said main controlled conduction path connects into the branch, at least one other of said terminals constituting an external termination point for connection to an input for selectively controlling the conductivity of said main controlled conduction path in accordance with said input thereby selectively controlling the conductivity of said main controlled conduction path to perform the switch function, said branch being free of separate overload protection devices external to said unit such that the current overload protection function within the branch is performed entirely by the protection of said main controlled conduction path within said unit by the associated overload protector.

4,799,127

SEMICONDUCTIVE CERAMIC COMPOSITION AND SEMICONDUCTOR CERAMIC CAPACITOR

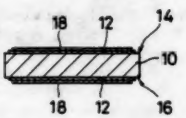
Shuichi Ono; Shuichi Itagaki; Masakiro Yahagi; Kiyoshi Furukawa; Shinobu Fujiwara, and Yasunobu Oikawa, all of Akita, Japan, assignors to TDK Corporation, Nihonbashi, Japan

Filed Jul. 29, 1987, Ser. No. 79,018

Claims priority, application Japan, Jul. 29, 1986, 61-176632; Jul. 29, 1986, 61-176633

Int. Cl.[4] H01G *4/10*; C04B *41/14*; H01B *3/02*

U.S. Cl. 361—321 **15 Claims**



1. A semiconductive ceramic composition comprising:

a base material comprising $SrTiO_3$; and

an additive for semiconductivity comprising Y_2O_3 and Nb_2O_5;

said Y_2O_3 and Nb_2O_5 each being present in an amount of 0.1 to 0.4 mol % based on said composition.

4,799,128

MULTILAYER PRINTED CIRCUIT BOARD WITH DOMAIN PARTITIONING

Paul T. H. Chen, St. Paul, Minn., assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 811,188, Dec. 20, 1985, abandoned. This application Apr. 10, 1987, Ser. No. 42,620

Int. Cl.[4] H05K *1/16*

U.S. Cl. 361—414 **5 Claims**

1. A multilayer printed circuit board comprising:

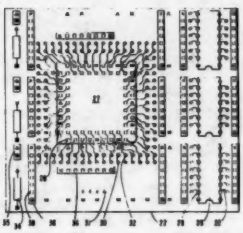
a plurality of substrates of insulating material bonded together forming the multilayer printed circuit board, each substrate having a surface on which is located a printed circuit comprising a pattern of lines of conductive material, said substrates being bonded in a mutually overlying relation, and each of said substrates being subdivided into equal surface areas in which each surface area has the same number and length of lines of conductive material;

a plurality of plated-through holes extending transverse to the substrates and positioned adjacent the lines of conductive material on said substrates, each of said equal surface areas containing at most a same predetermined number of plated-through holes;

a plurality of circuit elements including integrated circuit packages each having lead elements each of which is mounted within a plated-through hole and associated passive components mounted to the top surface of the circuit board, each of said equal surface areas is adapted to receive at most a same predetermined number of integrated circuit packages and at most a same predetermined number of associated passive components;

a plurality of monitor holes extending through the printed circuit board and located adjacent the lead elements of the circuit packages, each of said equal surface areas containing at most a same number of monitor holes;

a plurality of metallic bridge elements extending along the top surface of the circuit board connecting each of the lead elements of the integrated circuit package with a



monitor hole for testing electrical circuits located within the circuit board, said bridge elements being severable for isolating the electrical circuits located within the circuit board;

a plurality of metallic pad members located in the surface of each of said substrates engaging said plated-through holes for connecting selected lines of conductive material on a substrate, each of said pad members being formed in a square configuration having rounded corners in which a plated-through hole is located within the boundary of the pad member; and

a plurality of metallic segments mounted on the surface of said substrates adjacent said pad members and lines of conductive material, two of said metallic segments being connected to two adjacent rounded corners of each of said pad members and the same line of conductive material for transmitting signals between the pad members and the conductive material.

4,799,129

FLAT CABLE CONNECTING DEVICE

Satomi Izumino, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 945,810

Claims priority, application Japan, Apr. 7, 1986, 61-52003[U]

Int. Cl.[4] H02B *1/20*

U.S. Cl. 361—428 **4 Claims**

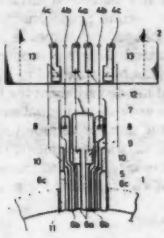
1. A flat cable connecting device, comprising:

a connector body;

a printed circuit board connected to the connector body, said printed circuit board having a plurality of connector pins disposed thereon;

a flat cable adapted to extend through a slit formed in a partition member, said flat cable comprising a plurality of printed wires formed thereon and at least one hole located at an end portion of the cable which receives therein at least one of said connector pins to establish mechanical and electrical connection between said flat cable and said printed circuit board, said at least one hole extending through one of said printed wires, said flat cable further

comprising a plurality of printed wire connecting sections located at said end portion of the flat cable along opposing lateral edges thereof and electrically connected to printed wires of the flat cable which do not have a hole extending therethrough;



said printed circuit board further comprising a plurality of conductor portions printed on said printed circuit board, said conductor portions electrically connecting the printed wire connecting sections to corresponding connector pins;

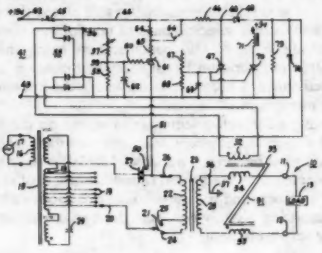
wherein said flat cable further comprises a body portion which is essentially as wide as the end portion thereof.

4,799,130

DIELECTRIC STRENGTH TESTER

Wayne C. Emerson, Black Creek, N.Y., assignor to Acme Electric Corporation, Olean, N.Y.

Filed Jul. 29, 1987, Ser. No. 79,129
Int. Cl.[4] H02H *00/00*; G08B *21/00*
U.S. Cl. 361—437 **14 Claims**



1. A high voltage, high volt-amperage dielectric strength tester for use with electrical equipment, comprising in combination:

a step-up transformer having a primary winding and a high voltage secondary winding of amperage capacity exceeding ten milliamps;

means to energize the primary winding of said step-up transformer through a first semiconductor switch;

means connecting a part of said secondary winding of said step-up transformer to ground;

first and second test terminals adapted to be connected to electrical equipment for dielectric tests;

means connecting said first and second test terminals to opposite ends of said secondary winding of said step-up transformer;

sensing means having an output winding and connected to be responsive to an imbalance of current flow through said first and second test terminals, and normally developing, without a ground fault, substantially zero current in said output winding; and

a control circuit connected to control the energization of said first semiconductor switch, said control circuit including input means from said output winding of said sensing means;

a second semiconductor switch having a control element and connected to control energization and de-energization of said first semiconductor switch; and

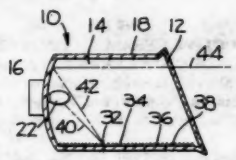
means connecting said input means to said control element of said second semiconductor switch to control the conduction condition thereof upon the current on said output winding of said sensing means exceeding a set point such as by a fault-to-ground on said step-up transformer secondary winding.

4,799,131

AUTOMOTIVE LIGHTING ELEMENT

Kenneth A. Aho, Chisago City; Jeffrey J. Melby, St. Paul, and Richard A. Miller, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 18, 1987, Ser. No. 121,947
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—61 **10 Claims**



1. An automotive lighting element comprising a reflector defining an optical cavity having an optical window and a light source in said optical cavity, said reflector comprising:

a smoothly curved portion;

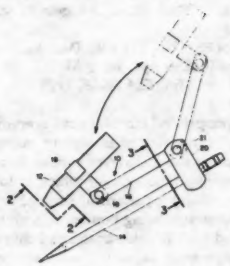
a structured surface portion having a plurality of ridges and grooves such that light emitted by said light source and striking said structured surface will be reflected a first time by said structured surface and a second time by said reflector prior to emerging from said optical cavity, said grooves having bases that are located in a plane.

4,799,132

MEANS FOR MOUNTING A MINI-FLASHLIGHT ON A WRITING INSTRUMENT

Leon Perlsweig, 23017 Gainford St., Woodland Hills, Calif. 91364

Filed May 20, 1988, Ser. No. 196,736
Int. Cl.[4] B43K *29/10*
U.S. Cl. 362—118 **5 Claims**



1. Mounting means for adjustably and removably supporting an illuminating device on a writing instrument comprising

an elongated support member,

first clip means pivotally coupled to one end of said member, said first clip means being rotatable about said one end in the plane of said member and adapted to releasably frictionally engage an elongated writing instrument, and

second clip means pivotally coupled to the other end of said member, said second clip means being rotatable about said other end in a common plane with said member and said first clip means and adapted to releasably frictionally engage an elongated illuminating device,

said first and second clip means extending from their pivotal couplings to said member in a direction substantially perpendicular to the longitudinal dimensions of writing instrument and illuminating device, respectively, when said clip means are in engagement with said writing instrument and illuminating device.

4,799,133

ILLUMINATED POINT-OF-SALE SHELF UNIT INSERT

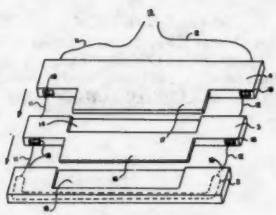
Peter Strzalko, Langenfeld; Franz-Josef Walber, and Ulrich Wombacher, both of Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,484

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639687

Int. Cl.[4] F21V *33/00*

U.S. Cl. 362—133 **11 Claims**



1. A device for inclusion in a point-of-sale shelf unit and for the illumination of sales articles offered on the device, comprising a substantially parallelepipedonal translucent housing of low height having at least one illuminating body which is located inside the region of the front longitudinal side surface and parallel thereto and which is in part bent backward at right angles into the interior of said housing in the region of laterally adjoining transverse side surfaces of said housing, said housing being assemblable in modular manner into a unitary unit having a planar support surface from individual bodies which are of equal length and height and matched one to the other, wherein said individual bodies in the region of their upper or lower side have depressions in at least a region thereof or have connecting tongues which protrude at the oppositely disposed longitudinal side and which are constructed to correspond with said depressions.

4,799,134

OPTICAL REFLECTOR SYSTEM FOR FLUORESCENT LIGHTING FIXTURES

David G. Pinch, Mesa, Ariz., and Spencer C. McGrath, 11055 N. 55th Ave., Glendale, Ariz. 85304, assignors to Spencer McGrath, Merced, Calif.

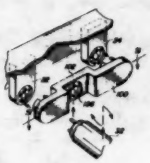
Filed Jul. 15, 1986, Ser. No. 885,656

Int. Cl.[4] F21S *3/00*; H01R *11/26*

U.S. Cl. 362—217 **3 Claims**

1. In a fluorescent lighting fixture of the type having at least two fluorescent light tubes within a housing, which housing has first and second conventional lamp holders disposed at opposite ends of the housing which receive connector pins at the end of said fluorescent light tubes, the improvement comprising:

(a) a pair of replacement lamp holders at the opposite ends of the lighting fixture at a location intermediate the location of the said first and second conventional lamp holders, each said replacement lamp holder having a body with a socket at an intermediate location adapted to receive the said pins of the lamp tube, each said replacement lamp holders further having first insert means adapted to be engaged with said first conventional lamp holder and



second insert means adapted to be engaged with said second spaced-apart conventional lamp holder, said socket and said first insert means being in electrical connection; and

(b) reflector means positioned above said replacement lamp holders, said reflector means being provided in a general planar condition having a reflective surface and having predetermined flexibility whereby when installed in the fixture, said reflector will assume a generally parabolic shape established by the geometry of the fixture.

4,799,135

HEADLIGHT FOR VEHICLE

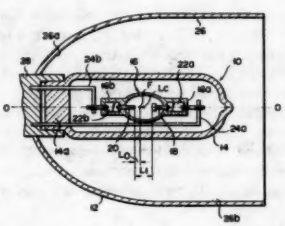
Shinji Inukai; Nobuyoshi Kuno; Hiroyoshi Takanishi, and Hiroki Sasaki, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 17, 1986, Ser. No. 920,063

Claims priority, application Japan, Oct. 18, 1985, 60-233073

Int. Cl.[4] F21V *7/00*

U.S. Cl. 362—296 **6 Claims**



1. A headlight for a vehicle adapted to be operated by a direct-current power source, comprising:

a high-pressure metal-vapor discharge lamp including a luminescent tube having at least sodium sealed therein as a luminescent metal, and including positive and negative electrodes having their respective distal ends spaced at a predetermined distance from each other and located in the luminescent tube; and

a reflector having a focus and reflecting a light beam, emit-

ted from the discharge lamp, in a forward direction from the front of the vehicle,

said discharge lamp being positioned along a straight line connecting the respective distal ends of the positive and negative electrodes, said straight line being horizontal and passing through the focus, and said discharge lamp being arranged to fulfill the following requirement so that the luminescent region of reddish light radiated from said at least sodium is located at the same position as the focus:

$$0 \leq L0/L1 \leq 0.4,$$

where L0 is the distance between the focus and the distal end of the negative electrode, and L1 is the predetermined distance between the respective distal ends of the positive and negative electrodes;

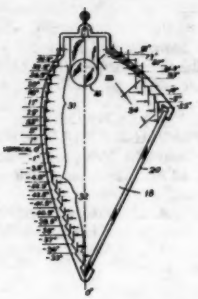
said discharge lamp in cooperation with said reflector producing a light beam having a luminous distribution pattern with reddish light, radiation from said at least sodium, being located at a center thereof and light of other colors being located around the reddish light.

4,799,136

LIGHTING FIXTURE HAVING CONCAVE SHAPED REFLECTOR AND IMPROVED ASYMMETRIC LIGHT REFLECTION SYSTEM

John P. Molnar, St. Louis, Mo., assignor to Guth Lighting Systems, Inc., St. Louis, Mo.

Filed May 29, 1987, Ser. No. 56,406
Int. Cl.[4] F21V 7/00
U.S. Cl. 362—300 7 Claims



1. A lighting fixture adapted for uniformly illuminating a substantially vertical wall surface of a room having upper, central and bottom portions, the fixture comprising:

(a) an elongated housing having a lower side and adapted to be rigidly supported below a ceiling surface;

(b) an elongated reflector pivotably attached to said housing lower side, said reflector having a generally concave shape formed with dual inner facing walls, one of said walls being a major length rear portion and the other said wall a minor length front portion, side end plates and a front opening;

(c) multiple reflecting facet surfaces in said major length rear portion and said minor length front portion having varying acute angles measured relative to a central vertical plane through said reflector and said light source, said angles on said major length rear portion being measured toward said light source and said angles on said minor length front portion being measured away from said light source;

(d) a light source centrally located within said reflector so as to be substantially enclosed by said reflector and by said end plates; and

(e) a diffuser plate capable of filtering ultraviolet light covering said front opening of said reflector;

(f) said varying acute angles being chosen such that direct light emanating from said light source is reflected by said multiple reflecting facet surfaces;

(i) from an upper zone of said major length rear portion to the bottom and central portions of said wall surface;

(ii) from a lower zone of said major length rear portion to the central and upper portions of said wall surface;

(iii) from an upper zone of said minor length front portion to the central portion of said wall surface; and

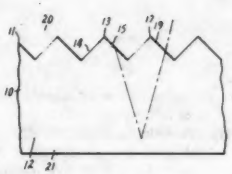
(iv) from a lower zone of said minor length front portion to said upper zone of said major length rear portion and then to the central portion of the wall surface; thereby illuminating said wall surface in an asymmetric pattern, so as to provide uniformly diffused light on said wall surface without producing hot spots, scallops or striations on said wall surface.

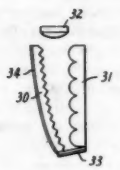
4,799,137

REFLECTIVE FILM

Kenneth A. Abo, Chisago City, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 24, 1987, Ser. No. 30,033
Int. Cl.[4] F21V 13/04
U.S. Cl. 362—309 13 Claims



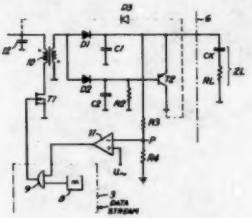


1. A light reflecting film formed of a transparent material, said film comprising first and second major surfaces, said first surface being a structured surface forming a plurality of triangular prisms, each of said prisms having first and second faces and said prisms forming a plurality of peaks and grooves and said second surface being second surface such that light entering one of said prisms through said prism's first face at less than a predetermined angle with respect to said second surface will be totally internally reflected by said prism's second face reflected by said light reflecting means and will emerge from said film through a different one of said prisms.

4,799,138
CIRCUIT FOR PRODUCING AN ALTERNATING VOLTAGE

Ziaedin Chahabadi, Bad Münder; Martin Brahms, and Olaf Wittur, both of Hanover, all of Fed. Rep. of Germany, assignors to kabelmetal electro Gesellschaft mit beschränkter Haftung, Hanover, Fed. Rep. of Germany

Filed Sep. 17, 1987, Ser. No. 98,390
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632746
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 9 Claims



1. A circuit for producing an alternating voltage in an electronic device which is connected to a d.c. voltage via a remote feed, said circuit being located within the device and comprising:

an electronic system, and a current supply which produces a voltage for operating the electronic system and for supplying a current for at least one load external to the device;

a clock producing pulses, a transformer having a primary winding and a secondary winding, a first transistor having a control electrode and being located within a current path of the primary winding, and a control element connected to the control electrode of the transistor, the pulses of the clock being fed via the control element to the control electrode of the first transistor, current of said secondary winding being divided among a first current path and a second current path;

a first diode and a first capacitor disposed in said first current path of said secondary winding, and a second diode and a second capacitor disposed in said second current path of said secondary winding, an output terminal of said secondary winding being connected via said first and said second diodes respectively to said first and said second capacitors;

a second transistor having a control electrode connected to said second capacitor, a first resistor connected in parallel to said second capacitor, and wherein the load includes capacitive and resistive elements serially connected between terminals of the load, the load being connected in parallel with said first capacitor and being connectd via a current path to said second transistor for discharge of said capacitive element;

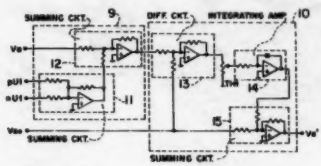
a comparator having a first input terminal and a second input terminal, a second resistor and a third resistor serially connected via a junction point to form a voltage divider; and wherein said voltage divider is connected in parallel to the first capacitor the junction point of the voltage divider being connected to the first input terminal of the comparator, an alternating voltage being fed as desired value to the second input terminal of the comparator; and wherein

an output terminal of the comparator is connected to the control element, an output state of said comparator varies in accordance with amplitude of said alternating voltage to induce repetitive periods of excitation of said primary winding by said first transistor, said first resistor acting to discharge said second capacitor between periods of excitation of said primary winding, a discharge of said capacitor activating said second transistor to reduce voltage across the load, thereby to provide alternating states of voltage to the load.

4,799,139
VOLTAGE REGULATION FOR THREE-PHASE INVERTERS

Matti Kihkipuro; Urpo Sten, both of Hyvinkää; Pekka Nummi, Nurmijärvi, and Pekka Hytti, Hyvinkää, all of Finland, assignors to Kone Elevator GmbH, Baar, Switzerland

Filed Mar. 16, 1987, Ser. No. 26,027
Claims priority, application Finland, Mar. 19, 1986, 861143
Int. Cl.[4] H02M *7/48*
U.S. Cl. 363—95 8 Claims



6. Apparatus for regulating the control voltage of a three-phase inverter supplying an a.c. motor having a power stage implemented using semiconductor switches, comprising:

three pulse width modulator means respectively associated with the three phases of said inverter;

means for regulating control voltages of respective ones of said pulse width modulatng means;

said voltage regulator means each comprising an actual value voltage forming means for deriving an actual value voltage from a voltage (Va) measured at a respective one of three outputs of said inverter; and

control voltage forming means for deriving said control voltage (Va') of the respective one of said pulse width modulators from said actual value voltage and a reference voltage (Va*), further including means for effecting full-wave rectification of a three-phase voltage to provide a pulsating d.c. positive voltage (pU1) and a pulsating d.c. negative voltage (nU1), said actual value forming means comprising first summing means for combining said positive voltage (pU1) and said negative voltage (nU1) to provide an a.c. voltage (VO) and second summing means for combining said voltage (Va') measured at said inverter output with said a.c. voltage (VO).

4,799,140
MAJORITY VOTE SEQUENCER

Ronald P. Dietz, and Jeffrey D. Johnson, both of Littleton, Colo., assignors to Orbital Sciences Corporation II, Fairfax, Va.

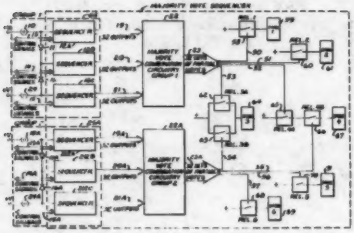
Filed Mar. 6, 1986, Ser. No. 837,059
Int. Cl.[4] G06F *11/08*
U.S. Cl. 364—140 19 Claims

1. A sequencer apparatus for controlling the timing and sequence in which a plurality of devices are electrically activated, comprising:

a plurality of sequencer means wherein each of said sequencer means sequentially generates at least one vote output signal having first and second states, wherein each of said vote output signals generated by each of said sequencer means corresponds to a vote output signal generated by each of the other of said sequencer means, and wherein each vote output signal generated by each of said sequencer means corresponds to at least one of the devices;

combining means for combining all of the corresponding

vote output signals from said plurality of sequencer means, each vote output signal being paired with each of the other corresponding vote output signals, said combining means generating one partial vote signal derived from each pair of corresponding vote output signals, a partial vote signal being in the first state when both vote output signals in the pair from which it is derived are in the first state, and a partial vote signal being in the second state when both vote output signals in the pair from which it is derived are not in the first state; and



a plurality of activating means responsive to the partial vote signals for activating the plurality of devices, at least one of said activating means corresponding to each of the devices, each of said activating means receiving only the partial vote signals derived from corresponding vote output signals, each of said activating means activating the device to which it corresponds when at least one partial vote signal received by it is in the first state.

4,799,141

ELECTRONIC CONTROLLER BASED ON THE USE OF STATE CHARTS AS AN ABSTRACT MODEL

Doron Drusinsky, Herzlia, and David Harel, Rehovot, both of Israel, assignors to Yeda Research and Development Company Limited, Rehovot, Israel

Filed Apr. 9, 1987, Ser. No. 36,526

Claims priority, application Israel, Apr. 18, 1986, 78542

Int. Cl.[4] G05B *11/01*

U.S. Cl. 364—141 **9 Claims**

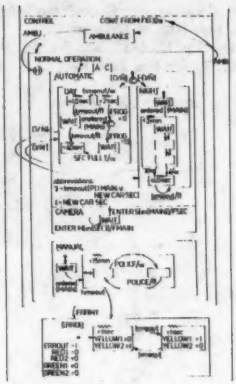
1. An electronic controller connectible to an external system comprising:

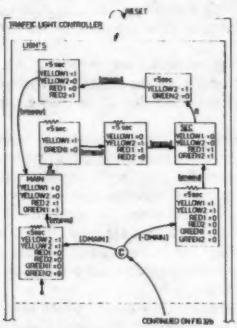
a plurality of logical networks each capable of assuming a plurality of different states and arranged according to a hierarchy of different networks according to a hierarchy of different states having a one-to-one mapping between states and networks such that any transition between two states affects the two associate networks and their respective lower-order networks;

each of said logical networks including a storage means for storing,its state, means for determining the next state, of the storage means and means for receiving control signals from, or for outputting control signals to, the immediately higher level logical network and the immediately lower level logical network for determining their respective states;

at least some of said logical networks including means for receiving control signals from, or for outputting control signals to, the external system;

said logical networks being disposed on a substrate;





and a plurality of electrical connections on the substrate connecting the logical networks to provide said one-to-one mapping between states and networks.

4,799,142

IRRIGATION CONTROLLER

Bernard Waltzer, Riverside, and Jeffery M. Moskin, Los Angeles, both of Calif., assignors to The Toro Company, Minneapolis, Minn.

Continuation of Ser. No. 883,467, Jul. 11, 1986, abandoned, which is a continuation of Ser. No. 574,397, Jan. 27, 1984, abandoned. This application Oct. 30, 1987, Ser. No. 117,441

Int. Cl.[4] G05B *11/1; A01G 27/00*

U.S. Cl. 364—143 **2 Claims**

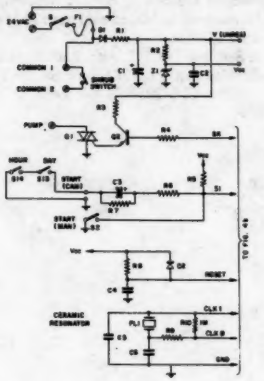
1. A low cost irrigation control system, comprising:

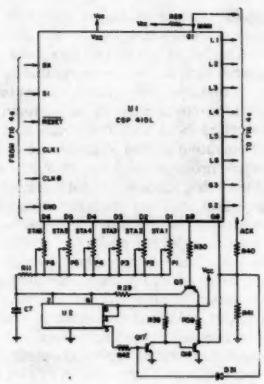
a plurality of irrigation stations;

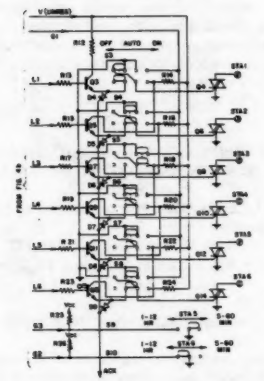
electronic controller means having a plurality of input terminals and a plurality of output terminals, said controller means including a counter means and an internal register means;

said electronic controller means providing to each of said stations a remote control dirve signal for selectively activating each of said stations according to a preprogrammed sequence, each station activated for a preprogrammed interval;

clock means connected to said input terminals of said controller means to establish a time standard for use by said internal register means and said counter means;







time selection means connected to said input terminals of said controller means for selecting a period of time during which an irrigation activity may take place, said time selection means including means for providing a start pulse to said controller;

time duration means including a variable resistor-capacitive network connected to said input terminals of said controller means for selecting a duration of time, determined by a time-constant of said resistor-capacitive network, said irrigation activity may occur, said time duration means providing an analog output signal to said controller, by way of a comparator means;

said counter means of said controller, using said time standard established by said clock means, incrementing a digital up-count for the duration of time set by the time duration means until the analog output signal is provided to said controller by said comparator means;

said terminal register means of said controller storing a final up-count that is a function of the time duration established by said time constant of said resistor-capacitive network of said time duration means;

a plurality of multi-position switching means, each having at least on, off, and automatic positions, and each connected between one of said output terminals of said controller means and each of said irrigation stations; when any of said switching means being set to said automatic position, said respective switching means providing a drive signal to said irrigation stations for a time duration that is a function of said final up-count stored in said internal register means and is substantially longer than the time constant of said resistor-capacitive network; and, switching means connected to said input terminals of said controller means to sense a selected position of said multi-position switching means;

whereby said controller means adjusts its control to accommodate selected positions of said switch means and said controller may be informed as to when sequentially activated stations have commenced and ended operation so that an entire automated cycle may be executed.

4,799,143

NC DATA CREATION METHOD

Kunio Tanaka; Takashi Takegahara, and Yasushi Onishi, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

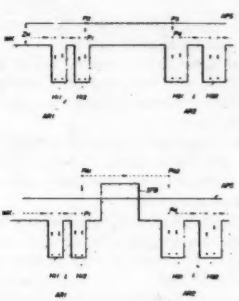
PCT No. PCT/JP86/00382, § 371 Date Mar. 23, 1987, § 102(e) Date Mar. 23, 1987, PCT Pub. No. WO87/00652, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 21, 1986, Ser. No. 43,347

Claims priority, application Japan, Jul. 22, 1985, 60-161574

Int. Cl.[4] G05B *19/00*

U.S. Cl. 364—191 **7 Claims**



1. An NC data creation method in an automatic programming apparatus having an auxiliary position input mode and in which NC data is created for moving a tool, after the tool has completed machining a first area of a workpiece, to a second area to subsequently perform predetermined machining at said second area, said method including the steps of:

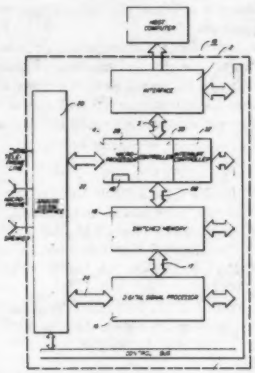
(a) determining if the auxiliary position input mode has been set;
(b) creating NC data in accordance with a predetermined rule for moving the tool from the first area to the second area if the auxiliary position input mode has not been set;
(c) initiating reception of an auxiliary position if the auxiliary position input mode has been set; and
(d) creating NC data for moving the tool to said second area via the auxiliary position if the auxiliary position input mode has been set.

4,799,144

MULTI-FUNCTION COMMUNICATION BOARD FOR EXPANDING THE VERSATILITY OF A COMPUTER

Bidyut Parruck, Hamden, and Hoshang D. Mulla, Trumbull, both of Conn., assignors to Alcatel USA, Corp., New York, N.Y.

Filed Oct. 12, 1984, Ser. No. 659,989
Int. Cl.[4] G06F *3/16*
U.S. Cl. 364—200 **23 Claims**



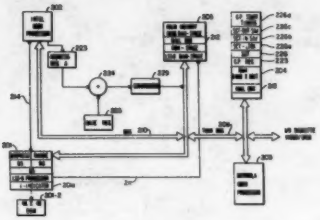
21. A multiple option computer card, said card comprising:
an onboard microprocessor having, as an integral part thereof, a dynamic RAM portion with an associated controller therefor, a ROM portion and an interrupt controller, said onboard microprocessor being controlled via an interface to a computer;
a digital signal processor connected to said onboard microprocessor and programmed thereby, said digital signal processor including a programmable read only memory and a random access memory;
means for accepting analog signals, said analog signal acceptance means having a plurality of switch means and interfacing with said onboard microprocessor and said digital signal processor; and
a switched memory including means for selectively coupling said switched memory to one of said onboard microprocessor and said digital signal processor, said means for selectively coupling being controlled by said onboard microprocessor, said random access memory exchanging information with said onboard microprocessor via said switched memory selectively coupled to one of said microprocessor and processor.

4,799,145

FACILITY FOR PASSING DATA USED BY ONE OPERATING SYSTEM TO A REPLACEMENT OPERATING SYSTEM

Gary J. Goss, Acton; Thomas S. Hirsch, Bedford, and Thomas O. Holtey, Newton, all of Mass., assignors to Honeywell Bull Inc., Minneapolis, Minn.

Continuation of Ser. No. 719,772, Apr. 3, 1985, abandoned. This application Sep. 21, 1987, Ser. No. 99,698
Int. Cl.[4] G06F *15/00, 9/00*
U.S. Cl. 364—200 **13 Claims**



1. In a computer system having at least first and second processors, a main memory coupled to said first processor, a second memory coupled to said second processor and an archival memory system such as disk memory, said first processor operating under a first operating system loaded into said main memory from said archival memory, apparatus for retaining information generated when said first processor is under control of said first operating system so that said information may be used by said first processor under control of a second operating system after being loaded into said memory from said archival memory, said retaining apparatus comprising:
(a) first means for storing information generated while said first processor is under the control of said first operating system, the information to be utilized by said first processor under control of said second operating system, said first means being volatile storage means storing such information after said first processor is restarted under control of said second operating system; and
(b) second means cooperating with said volatile first storage means for passing stored information to said first processor under control of said second operating system, said second means storing said stored information stored in said first means into said second memory as the main memory is reloaded with the second operating system,
wherein the information stored in the second memory is updated by the second processor until the updated information is return to the first means.

4,799,146

SYSTEM FOR DISPLAYING GRAPHIC INFORMATION ON VIDEO SCREEN EMPLOYING VIDEO DISPLAY PROCESSOR

Gerard Chauvel, Cagnes/Mer, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 19, 1985, Ser. No. 746,422
Claims priority, application France, Jun. 29, 1984, 84 10377
Int. Cl.[4] G06F *13/18*
U.S. Cl. 364—200 **5 Claims**

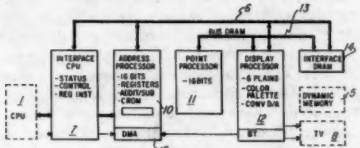
1. A system for displaying graphic information on a video screen, comprising:
memory means having a plurality of addressable memory locations in which said graphic information is to be stored;
a central processing unit for controlling the information to be displayed;
video display processor means for producing said graphic information and for storing said graphic information in said memory means;

communication bus means interconnecting said memory means, said central processing unit, and said video display processor means, said central processing unit presenting information on said communication bus means as time-multiplexed address and data fields, said address field defining an address space having first and second value ranges, said first value range of the address space defined by said address field corresponding to locations in said memory means addressable by said central processing unit, said second value range of the address space defined by said address field corresponding to a set of instructions for the video display processor means;

said video display processor means being connected to said memory means for accessing and modifying the contents of locations in said memory means containing said graphic information;

control circuit means connected to said central processing unit, said video display processor means and said memory means for controlling access to said memory means by said video display processor means and said central processing unit;

interpretation means connected to said communication bus means, said control circuit means and said video display



processor means for decoding the address fields presented by said central processing unit on said communication bus means;

said control circuit means being responsive to receiving a decoded address value in said first value range of said address space defined by said address field for enabling access between said central processing unit and said memory means, and being responsive to receiving a decoded address value in said second value range of said address space defined by said address field for controlling said video display processor means to execute an instruction corresponding to the value of said address field;

an address value providing access to said memory means from said central processing unit having a predetermined priority of operation over an address value defining an instruction to be executed by said video display processor means; and

said interpretation means interrupting the operation of one of said instructions being executed by said video display processor means in response to the reception of an address value in said first value range of said address space defined by said address field corresponding to an operation of higher priority.

4,799,147

ON CHIP SIGNAL SELECTION METHOD AND APPARATUS

Peter M. Heslin, Natick, Mass., assignor to Honeywell Bull Inc., Waltham, Mass.

Filed Mar. 26, 1987, Ser. No. 31,318
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **31 Claims**

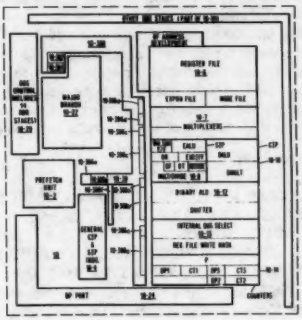
1. A LSI microprocessor chip having an area including a plurality of functional areas containing a plurality of sources and on-chip apparatus for selecting signals from said plurality of sources, said on-chip apparatus comprising:

a plurality of decoder circuit means, each decoder circuit means being located at a different predetermined position on said chip, said different predetermined position being adjacent to at least one of said functional areas;

an access bus having a predetermined number of lines, said bus being distributed throughout said area of said chip as a function of said signals provided by the sources according to how said signals are concentrated on said chip;

a number of pluralities of transistor switching means, each plurality of said switching means being connected to one of said decoder circuit means located closest thereto, to said plurality of sources of an adjacent functional area and to selected ones of said access bus lines;

a control bus having a plurality of lines distributed and



connected to each of said decoder circuit means for simultaneously applying a set of control signals to said plurality of decoder circuit means; and,

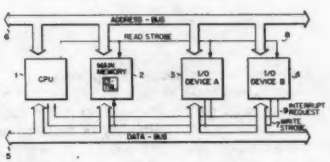
final selection circuit means connected to terminate said access bus lines, said selection circuit means being located adjacent to one of said functional areas which is to receive an output signal from said final selection circuit means, said plurality of decoder circuit means being simultaneously enabled by said set of control signals to transmit signals from said sources contained within said plurality of functional areas on said lines of said access bus to said final selection circuit means for accomplishing the final selection of an output signal.

4,799,148

INTERRUPT CONTROL SYSTEM HAVING A PROCESSOR FOR DETERMINING SERVICE PRIORITY AMONG A PLURALITY OF MODULES ACCORDING TO AN INTERRUPT STATUS TABLE

Syoji Nishioka, Fujinomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 29, 1985, Ser. No. 792,559
Claims priority, application Japan, Oct. 30, 1984, 59-228529
Int. Cl.[4] G06F *13/24*
U.S. Cl. 364—200 **8 Claims**



1. A data processing system comprising:

data processing means for controlling system operation;

a plurality of modules which request interrupts for requesting services from said data processing means;

memory means for storing information to be processed by said data processing means, said memory means including a plurality of memory locations assigned to each of said modules respectively;

each of said modules including writing means for writing interrupt status data to a corresponding one of said memory locations for requesting an interrupt for the writing module, and means for generating an interrupt request signal to notify said data processing means that an interrupt request has occurred in the system, concurrently with said writing interrupt status data;

an interrupt request line, connected to said modules and said data processing means, for wired-ORing said interrupt request signals output by any of said modules, and transmitting said wired-ORed request signals to said data processing means; and

said data processing means receiving said wired-ORed interrupt request signals and recognizing that any of said modules requests an interrupt, responsive to said recognition of said wired-ORed interrupt request signals, reading said interrupt status data from each of said memory locations to determine which of said modules is to be serviced.

4,799,149

HYBRID ASSOCIATIVE MEMORY COMPOSED OF A NON-ASSOCIATIVE BASIC STORAGE AND AN ASSOCIATIVE SURFACE, AS WELL AS METHOD FOR SEARCHING AND SORTING DATA STORED IN SUCH A HYBRID ASSOCIATIVE MEMORY

Gerhard Wolf, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

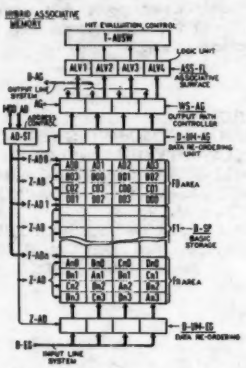
PCT No. PCT/DE84/00072, § 371 Date Nov. 15, 1984, § 102(e) Date Nov. 15, 1984, PCT Pub. No. WO84/03970, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 29, 1984, Ser. No. 681,993

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311665; May 30, 1983, 3319581; Sep. 23, 1983, 3334536; Sep. 23, 1983, 3334515

Int. Cl.[4] G06F *7/02, 12/00*

U.S. Cl. 364—200 **62 Claims**



1. A hybrid associative memory, comprising:

(a) a non-associative basic storage means for storage of at least one group of data units wherein every data unit is subdivided into a constant plurality of data sub-units, the basic storage means being divided into data unit sections each formed of data unit sub-sections, the data unit sections storing the data units and the data unit sub-sections storing the data sub-units, the data unit sections being arranged vertically and being separated into a plurality of areas such as that each area has a plurality of the data unit sections associated therewith, the data units compared to one another within each area having respectively corresponding data sub-units, and said basic storage means having an offset storage of said data sub-units such that for adjacent data unit sections in each area, the respectively mutually corresponding data sub-unit of one data unit is laterally offset with respect to the mutually corresponding data sub-unit of the data unit lying vertically adjacent;

(b) addressing means connected to the basic storage means for creating respective area addresses for addressing the areas, for creating data unit section addresses for addressing data units in the data unit sections, and for creating selection addresses derived from the data unit section addresses for addressing data sub-units in the basic storage sub-unit sections;

(c) selection means connected with the addressing means for selection of a memory operating mode and, given a normal memory operating mode, for setting the addressing means for simultaneous selection of data sub-units of a given data unit, for in an alternate memory operating mode for selecting a set of said mutually corresponding data sub-units from said unit sections in a given area;

(d) re-ordering means connected to the basic storage means and addressing means for changing a sequence of the data sub-units of a respective data unit to be stored or to be read at least given said normal memory mode in order to recover a proper sequence when reading, or for producing a sequence required for ordering of the data sub-units in the memory with a determinant data unit section address for one of the data unit sections in a respective area;

(e) an associative surface connected to outputs of the data re-ordering means and comprising a plurality of logic units corresponding to the plurality of data sub-units that can be simultaneously read out from the basic storage means for a simultaneous associative check of the individual data sub-units supplied from the basic storage means; and

(f) a hit evaluation control means connected to and for sharing by all logic units.

4,799,150

INTERFACE SYSTEM BETWEEN A HOST COMPUTER AND A PERIPHERAL PROCESSOR WITH ADDRESS DETECTION CIRCUITRY

Le Bui, Fremont, Calif., assignor to Orchid Technology, Fremont, Calif.

Filed Jul. 29, 1985, Ser. No. 760,163

Int. Cl.[4] G06F *13/12, 12/00, 15/16*

U.S. Cl. 364—200 **10 Claims**

1. A computer interface system having an application mode of operation and an I/O mode of operation, for connection between a host computer and a peripheral processor which operate independently from one on another during the application mode of operation and which communicate with one another through the interface system during the I/O mode of operation, comprising:

peripheral bus means for connection to the peripheral proceasor, having a peripheral address portion for receiving instruction addresses from the peripheral processor, and having a peripheral data portion for transferring data from the peripheral processor to the interface system and from the interface system to the peripheral processor;

host bus means for connection to the host computer, having a host address portion for receiving instruction addresses from the interface system and having a host data portion for transferring data from the host computer to the interface system and from the interface system to the host computer;

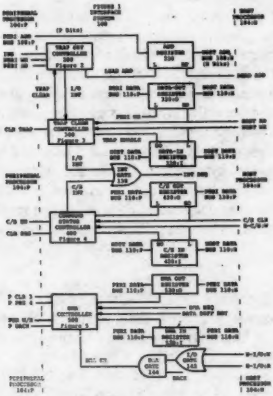
instruction address detector means responsive to a predetermine pattern of binary values on at least a portion of the address bits within one instruction address at a time on the address portion of the peripheral bus means;

I/O set means responsive to the instruction address detector

means for terminating the application mode of operation and initiating the I/O mode of operation;

I/O clear means responsive to a host clear signal from the host computer for terminating the I/O mode of operation and returning the interface system to the application mode of operation;

address transfer means for storing instruction addresses from the address portion of the peripheral bus means in response to a write signal from the peripheral processor, and for transferring the instruction addresses to the host computer on the host bus means in response to a read address signal from the host computer;



data-out transfer means for storing data from the peripheral bus means in response to a peripheral write signal from the peripheral processor, and for transferring the data to the host computer on the host bus means in response to a host data read signal from the host computer; and

data-in transfer means for storing data from the host bus means in response to a host write signal from the host computer, and for transferring the data to the peripheral processor on the peripheral bus means in response to a peripheral read signal from the peripheral processor.

4,799,151

MICROPROGRAM CONTROL CIRCUIT

Toshio Iwao, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 17, 1986, Ser. No. 942,785

Claims priority, application Japan, Dec. 20, 1985, 60-286934

Int. Cl.[4] G06F 9/22

U.S. Cl. 364—200 **3 Claims**

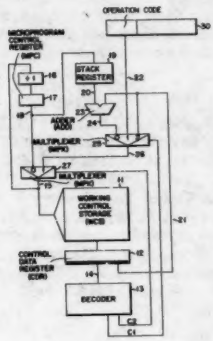
1. A microprogram control circuit, executing ones of a series of microinstructions, and comprising:

microinstruction storing means for storing the microinstructions including a return instruction having an offset designating field for designating an offset value from a return address in a pair program, one of the microinstructions being an executing microinstructions;

return address storing means for storing the return address in the main program, in response to a branch instruction in the main program;

adding means, connected to said return address storing means and said microinstruction storing means, for adding the offset value designated in the offset designating field and the return address stored in said return address storing means yielding an addition result, and for outputting the addition result, when the executing microinstruction in said microinstruction storing means is the return instruction; and

address supplying means, connected to said adding means and said microinstruction storing means, for supplying the addition result from said adding means to said microinstruction storing means, said addition result designating the one microinstruction in the series of microinstructions to be executed next.



4,799,152

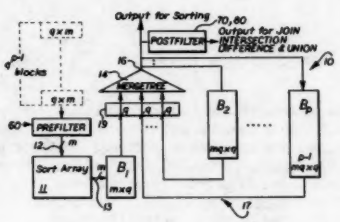
PIPELINE FEEDBACK ARRAY SORTER WITH MULTI-STRING SORT ARRAY AND MERGE TREE ARRAY

Henry Y. H. Chuang, Pittsburgh, Pa., and Guo He, Wuhan, China, assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Oct. 12, 1984, Ser. No. 660,465

Int. Cl.[4] G06F 7/36, 15/00

U.S. Cl. 364—200 **9 Claims**



1. A pipeline feedback array sorter comprising:

(a) a multi-string sort array having m inputs and outputs, where m is the width of said array or the number of data strings and is greater than or equal to 2;

(b) a merge tree array having q leave nodes connected to the output of one of p buffer memories through a multiplexor for successively merging the columns of a buffer memory to fill subsequent buffer memory columns and having an output from the root node, where q is greater than or equal to 2 and p is greater than or equal to 1;

(c) a first buffer memory having m inputs connected to the corresponding m outputs of said multi-string sort array for filling said first buffer memory and q outputs, said first buffer memory having m×q memory units, each of said units for holding one data item, said first buffer memory having two dimensional data movements;

(d) p−1 buffer memories in feedback loops and having a single dimensional data movement, each of said p−1 buffer memories having an input connected with said output of said merge tree array and q outputs connected to said q leave nodes of said merge tree array, wherein each

of said p buffer memories serve as input buffers to said merge tree array; and

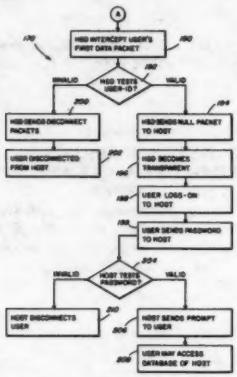
(e) a multiplexor for controlling and filling from said first buffer memory and p−1 buffer memories electrically connected to the inputs to said merge tree, whereby merging the columns of the p-th buffer memory a final sort is obtained from said root node of said merge tree array.

4,799,153

METHOD AND APPARATUS FOR ENHANCING SECURITY OF COMMUNICATIONS IN A PACKET-SWITCHED DATA COMMUNICATIONS SYSTEM

J. David Hann, Vienna, Va.; Theodore S. Holdahl, Bethesda, Md., and James C. P. Lum, Herndon, Va., assignors to Telenet Communications Corporation, Reston, Va.

Continuation of Ser. No. 681,751, Dec. 14, 1984, abandoned.
This application Sep. 17, 1987, Ser. No. 97,278
Int. Cl.[4] H04L 9/00
U.S. Cl. 364—200 9 Claims



1. In a packet-switched data communications system having a network with at least one data entry and display terminal for system users and at least one host data processor having a stored database for communicating with said terminal via plural data transmission paths of said network, wherein communication and processing of data is accomplished according to a pre-established protocol and data format and with preprogrammed software and wherein any user may obtain access from a terminal to the database associated with a selected processor for a data communications session therewith, the security improvement comprising:

a terminal security means introduced into said system in data communicative relationship with said terminal and said network for generating an initial data packet including data identifying an authorized user and the address of the processor with the database to be accessed, in advance of at least one additional data packet containing message data to be processed by the addressed processor, said initial data packet generated in said format and compatible with said protocol but incompatible with said programmed software for processing by the addressed processor, said terminal security means including

means responsive to user-initiated data entry seeking access from a terminal for detecting whether the data entry includes user identify data, and

means responsive to said detection for transmitting said initial data packet and said at least one additional data packet to the addressed processor via said network; and

a host security means introduced into said system in data communicative relationship with said network to intercept and process said initial data packet for allowing or denying the requested access according to whether any user identity data contained in the intercepted initial data packet designates the initiating user as authorized or unauthorized, respectively, to obtain the requested access, said incompatibility of said initial data packet rendering it and immediately following data packets unsuitable for processing by the addressed processor, whereby neither data contained in the initial data packet nor the message data contained in additional data packets immediately following said initial data packet can be processed by the addressed processor should said host security means fail for any reason to intercept said initial data packet, said host security means including

means for processing the intercepted initial data packet to detect any such user identity data contained therein,

means responsive to detected user identity data for authenticating the authorization of the user therefrom, and

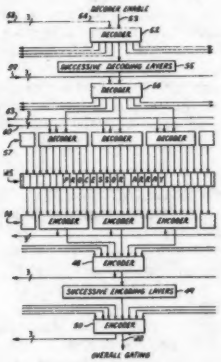
means responsive to authentication of user authorization for generating an artificial data packet in place of said initial data packet, to render the immediately following data packets compatible with both said protocol and said preprogrammed software to enable the addressed processor to process the message data contained in said at least one additional data packet and to provide the requested access for a communications session with the authorized user.

4,799,154

ARRAY PROCESSOR APPARATUS

Kim N. Matthews, Romford, and Terence J. Fountain, Beckenham, both of England, assignors to National Research Development Corporation, London, England

Filed Nov. 15, 1985, Ser. No. 798,800
Claims priority, application United Kingdom, Nov. 23, 1984, 8429599
Int. Cl.[4] G06F 9/06
U.S. Cl. 364—200 10 Claims



1. Apparatus for processing an array of items of data comprising:

an array of processors, one processor for, and corresponding to, each item in the array of data items, each processor having an output terminal connected to an input terminal of at least one other processor in the array;

means for applying data to the processors and reading data therefrom;

priority encoder means, having input terminals with a priority order, for providing an output signal indicating which of said input terminals receives a signal having a predetermined value and has the highest priority; and

means for connecting the processors to the input terminals of the priority encoder means to give each processors a

priority which depends on its position in the processor array,

wherein the encoder means comprises:

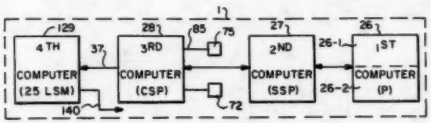
means for producing an output signal representing the position in the processor array of the highest priority processor having an output signal of said predetermined value, and a plurality of priority encoder circuits, each said priority encoder circuit having a plurality of input terminals, and a plurality of output address terminals, input signals applied to the input terminal of said priority encoder circuits being uniquely mapped to signals on the address output terminals.

4,799,155

DATA PROCESSING SYSTEM HAVING A HIERARCHY OF SERVICE COMPUTERS INCLUDING A STATE DISPLAY

J. Chris Wilson, Santa Clara, and Arun Shah, Cupertino, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Dec. 31, 1986, Ser. No. 948,111
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—200 **25 Claims**



1. A data processing system comprising, a general-purpose, programmable first computer constructed from a plurality of first circuits, said first circuits having direct connections for accessing said first circuits in connection with the execution of a first program of instructions, said first circuits having first redundant connections for use in accessing said first circuits independently of said first program of instructions, said first computer including first scanner means for accessing said first redundant connections,

a programmable second computer constructed from a plurality of second circuits, said second circuits having direct connections for use in the execution of a second program of instructions using selected ones of said second circuits, said second circuits having second redundant connections for accessing said second circuits independently of said second program of instructions, said second computer including second scanner means for accessing said second redundant connections, said second computer connected to said first scanner means whereby said second program controls the accessing of said first circuits through said first redundant connection and independently of said first program of instructions,

a programmable third computer constructed from a plurality of third circuits, said third computer executing a third program of instruction, said third computer connected to said second scanner means whereby said third computer controls the accessing of said second circuits through said second redundant connections under control of said third program and independently of said second program, said third computer including means for continuously monitoring said second computer to determine if said second computer requires control by said third computer,

a display means for displaying scan data, and

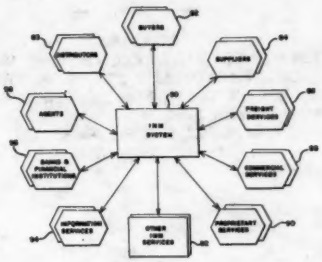
a fourth computer coupled to said display means for controlling the display of scan data from said third computer.

4,799,156

INTERACTIVE MARKET MANAGEMENT SYSTEM

Eyal Shavit, New York, N.Y., and Lester Teichner, Chicago, Ill., assignors to Strategic Processing Corporation, New York, N.Y.

Filed Oct. 1, 1986, Ser. No. 914,172
Int. Cl.[4] G06F *15/21*
U.S. Cl. 364—401 **43 Claims**



1. A system for interactive online electronic communications and interactive on-line processing of business transactions between different types of independent users including at least a plurality of separate on-line sellers, and a plurality of buyers, wherein each user communicates with the system, the system comprising:

access means for providing selective access by users to a data base and for permitting selection of users by at least one other user;

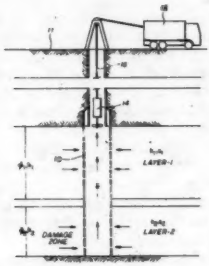
processing means responsive to the access means for interactive on-line processing of a business transaction between one of the plurality of buyers and one of the plurality of online sellers wherein one party to the transaction is specifically selected by the other party via the access means.

4,799,157

METHOD FOR UNIQUELY ESTIMATING PERMEABILITY AND SKIN FACTOR FOR AT LEAST TWO LAYERS OF A RESERVOIR

Fikri Kucuk, and Luis C. Ayestaran, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 648,113, Sep. 7, 1984, abandoned. This application Jun. 9, 1987, Ser. No. 62,324
Int. Cl.[4] E21B *47/00*; G01F *13/00*
U.S. Cl. 364—422 **4 Claims**



1. A well test method for estimating the permeability and skin factor of two layers in a reservoir comprising the steps of:

(1) positioning a logging tool in a first position at the top of the first layer of the reservoir;

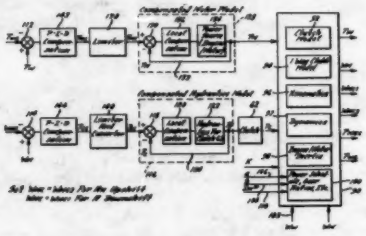
(2) changing the surface flow rate of the reservoir;
(3) measuring both the downhole fluid flow rate of the reservoir and pressure at said logging tool as a function of time;
(4) positioning said logging tool in a second position at the top of the second layer of the reservoir;
(5) repeating steps 2 and 3; and
(6) combining said measured fluid flow rates and pressures to estimate the permeability and skin factor of said layers.

4,799,158

SYSTEM FOR COMPUTER CONTROLLED SHIFTING OF AN AUTOMATIC TRANSMISSION

Prabhakar B. Patil, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 27, 1986, Ser. No. 867,177
Int. Cl.[4] B60K *41/06*
U.S. Cl. 364—424.1 **9 Claims**



1. In a powertrain system for controlling the gear ratio changes of a multiple gear ratio automatic transmission having a gearset and a clutch whose pressure magnitude determines the gear ratio at which the transmission is operating, the transmission driveably connecting a power source and the drive wheels of a motor vehicle, a method for controlling the powertrain comprising the steps of:

modeling the kinematic and dynamic characteristics of the power source, gearset and clutches by formulating mathematically the output torque Tw of the transmission and the angular speed Wm of the power source for each of the gear ratios of operation and for the period during a gear ratio change as a function of an updated output torque Tm of the power source and an updated clutch torque Tc;

determining experimentally a first local compensation feedback required to produce the updated power source torque response to a power source torque command Tmc such that the torque response requirements of the system are realizable;

determining experimentally a second local compensation feedback required to produce the updated clutch torque response to a clutch torque command Tcc such that the torque response requirements of the system are realizable;

generating a first error Twe defined as the difference between the actual transmission output torque and a transmission output torque command;

determining the compensation required to produce the power source torque command Tmc as a function of the first error Twe;

generating a second error Wme defined as the difference between the actual power source speed and a power source speed command;

determining the compensation required to produce the clutch torque command Tcc as a function of the second error Wme;

converting the clutch torque command to a clutch pressure command Pcc;

generating a third error Tme defined as the difference between the updated power source torque and a power source torque command and producing as output from the first local compensation feedback the updated power source torque;

generating a fourth error Pce defined as the difference between the updated clutch pressure and a clutch pressure command and producing as output from the second local compensation feedback the updated clutch pressure Pc;

controlling the clutch torque by applying the updated clutch pressure to the clutch; and

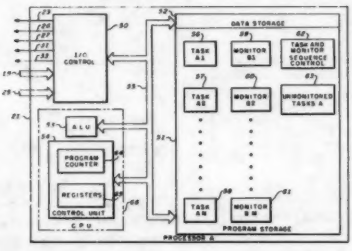
controlling operation of the powertrain by issuing repetitively a transmission output torque command Twe and a power source speed command Wmc determined by use of the updated power source torque, the updated clutch pressure, and the formulation that relates said commands, said updated power source torque and said updated clutch pressure.

4,799,159

DIGITAL AUTOMATIC FLIGHT CONTROL SYSTEM WITH DISPARATE FUNCTION MONITORING

Dale D. Davidson, and Douglas G. Endrud, both of Glendale, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 30, 1985, Ser. No. 739,583
Int. Cl.[4] G06F *11/08, 15/50*
U.S. Cl. 364—424.06 **5 Claims**



1. An automatic flight control system for aircraft having sensor means for providing sensor signals in accordance with flight conditions experienced by said aircraft and having aircraft control means responsive to aircraft control command signals for controlling said flight conditions of said aircraft and for providing flight condition control signals to control aircraft functions affecting said flight conditions, one channel of said automatic control system comprising:

digital computer means having computer input means responsive to said sensor signals and said flight condition control signals, program memory means, and computer output means;

computer input coupling means for coupling said sensor signals and said flight condition control signals to said computer input means;

computer output coupling means for coupling said computer output means to said aircraft control means for providing aircraft control command signals thereto;

said digital computer means having a program stored in said program memory means comprising a plurality of first program segments for execution by said digital computer means such that said digital computer means operates responsively to said sensor signals by performing a plurality of tasks to provide said aircraft control command signals, which control said aircraft functions, to said computer output means;

said program further including a plurality of second program segments, correspondingly associated with said first program segments and responsive to said sensor signals, for respectively monitoring performance of said first program segments;

each said second program segment performing a disparate task over mutually disjoint computation paths with re-

spect to said corresponding first program segment, said disparate tasks are arranged to test if said aircraft is performing in a manner prohibited by said aircraft functions controlled by said corresponding first program segment;

means for controlling repeated iterations of said program; and

means for assuring that all of said second program segments are executed during each iteration of said program.

4,799,160

CLUTCH AUTOMATION DEVICE

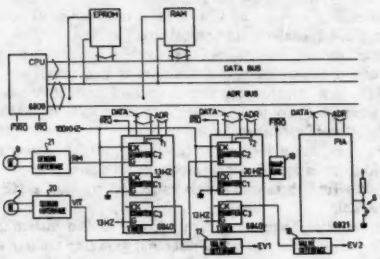
Yves Arbeille, Verrieres-le-Buisson; Yves Drutel, and Alain Viguier, both of Meudon-la-Foret, all of France, assignors to Renault Agriculture, Villacoublay, France

Filed Nov. 7, 1985, Ser. No. 795,943

Claims priority, application France, Nov. 7, 1984, 84 16959

Int. Cl.[4] G05D *16/20*; F16D *25/14, 47/06*

U.S. Cl. 364—424.1 **2 Claims**



1. A device for controlling engagement of a hydraulic clutch having a jack, said device comprising:

a first hydraulic control valve having a first solenoid for regulating fluid flow from a pressurized hydraulic fluid source to the jack to urge the clutch to engage;

a second hydraulic control valve having a second solenoid for regulating fluid from the jack to a reservoir to allow the clutch to disengage;

an actuating contact for providing a clutch operation signal indicating operation of the clutch;

a first pulse sensor for monitoring engine speed of a vehicle and providing an engine speed signal proportional to the monitored vehicle engine speed;

a second pulse sensor for monitoring wheel speed of a vehicle and providing a wheel speed signal proportional to the monitored vehicle wheel speed; and

electronic control circuitry responsive to the clutch operation signal for controlling the first and second hydraulic valves to cause the clutch to engage gradually, the electronic control circuitry including calculating means, valve control signal generating means, and means for regulating the valve control signal generating means; the calculating means receiving the engine speed signal and the wheel speed signal from the pulse sensors and calculating the vehicle engine speed and wheel speed therefrom, the valve control signal generating means generating first and second pulsed valve control signals having a common constant frequency and having current carrying times limited to vary between, but without reaching, a current carrying time causing constant energization of the solenoids and a current carrying time insufficient for energization of the solenoids, and the regulating means regulating the valve control signal generating means according to the engine speed and wheel speed of the vehicle as calculated by the calculating means to alternatively generate the first valve control signal with a relatively greater current carrying time than the second valve control signal, to cause the jack to be filled with fluid passed by the first control valve, or the first valve control signal with a relatively lesser current carrying time than the second valve control signal, to cause the jack to discharge fluid through the second control valve.

4,799,161

CONTROL APPARATUS FOR MAINTAINING TRACTION IN ELECTRIC ROLLING STOCK

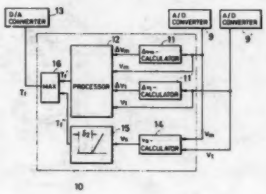
Tetsuji Hirotsu; Kiyoshi Nakamura; Syoji Kasai; Hiroshi Yamaguchi, and Eiji Kozu, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1986, Ser. No. 894,102

Claims priority, application Japan, Aug. 14, 1985, 60-177529

Int. Cl.[4] B61C *15/08*

U.S. Cl. 364—426.01 **16 Claims**



1. A control apparatus for electric rolling stock, comprising:

at least one electric motor for driving the rolling stock;

torque command generating means for generating a command Tp for a driving torque during power running of the rolling stock and for a braking torque during braking of the rolling stock, and for controlling said electric motor in accordance therewith;

first velocity detection means for detecting a peripheral velocity v_m of a wheel of the rolling stock, to which the driving or braking force F is applied;

second velocity detection means for detecting a velocity v_f of the rolling stock;

processing unit means for receiving signals representative of the velocities v_m and v_f produced by said first and second velocity detection means and for producing a re-adhesion control signal in accordance therewith, said processing unit means including means for comparing the velocities v_m and v_f and for producing an adhesion-state-relative signal v_s in accordance therewith, means for discriminating on the basis of the adhesion-state-relative signal v_s whether or not the wheels, to which the driving or braking force F is applied, are in a developing period of a nonadhesion state in which the force F remains larger than an adhesive force available at a location of a rail where the rolling stock is now running, and for producing, when it is discriminated that the nonadhesion state of the wheels is in the developing period on the basis of a calculation using the adhesion-state-relative signal v_s, the re-adhesion control signal Tf including a nonadhesion-independent component e_1 which is produced upon occurrence of the nonadhesion state of the wheels and changes in its magnitude independently from the adhesion-state-relative signal v_s and a nonadhesion-dependent component e_2 which changes in its magnitude in accordance with the adhesion-state-relative signal v_s, and for producing after it is discriminated that the developing period of the nonadhesion state is terminated and is in a nondeveloping period of nonadhesion, the re-adhesion control signal Tf including a component decreased with a certain time constant; and

control means, responsive to a torque reference obtained by correcting the torque command T_p based on the re-adhesion control signal Tf, for controlling the driving or braking torque produced by said at least one electric motor to

regulate the driving or braking force F applied to wheels of the rolling stock.

4,799,162

ROUTE BUS SERVICE CONTROLLING SYSTEM

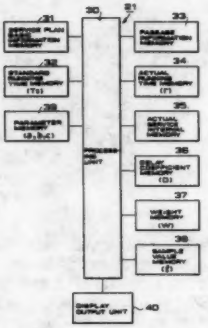
Kiyoshi Shinkawa; Takeshi Kawahara; Hideki Hayakawa, and Masaru Mori, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 923,093

Claims priority, application Japan, Oct. 25, 1985, 60-239056; Oct. 25, 1985, 60-239058; Oct. 29, 1985, 60-244544; Oct. 29, 1985, 60-244545; Nov. 6, 1985, 60-249611; Mar. 18, 1986, 61-62054

Int. Cl.[4] G06F *15/48*; G08G *1/01*

U.S. Cl. 364—436 **6 Claims**



1. A route bus service controlling system including a mobile radio unit equipped on a route bus, ground radio units installed at certain intervals of distance along the entire route of the bus, a central processor which calculates expected operational information for a specific section of said route based on passage information provided by said mobile radio unit and ground radio units, and a plurality of display units for displaying said expected operational information, wherein said central processor comprises:

(a) a memory for storing service plan basic information, passage information, actual running time in said specific section, standard running time, and actual service interval; and

(b) a processing unit which:

(1) adds a passage time of a bus under forecast at the arrival at a latest ground radio unit to a sum of expected running time for divided unit segments of route where the bus has not yet run,

(2) sets a finite time frame for providing the running time of buses which have run in the past,

(3) calculates an average movement value of a plurality of buses which have passed in said specific section before the bus under forecast by using a delay coefficient normalized for the standard running time and a weight value for the actual running time,

(4) determines a sample value showing an average movement value of each specific section for the bus under forecast from the calculated average movement value,

(5) calculates an expected running time in each specific section by multiplying said sample value by said standard running time, and

(6) calculates arrival time at a specific location by cumulating expected running time of each specific section in a portion of route where the bus has not yet run through a similar computational process; and

(c) wherein arrival time at a specific location and information of route bus operation calculated by said processing unit is displayed on display units provided in each location of the bus route and on each route bus.

4,799,163

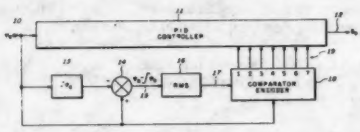
AUTOPILOT WITH ADAPTIVE WEATHER ADJUSTMENT FOR MARINE VESSELS

Charles R. Wesner, Crozet, Va., assignor to Sperry Marine Inc., Charlottesville, Va.

Filed Feb. 2, 1987, Ser. No. 10,861

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—457 **6 Claims**



1. Heading keeping apparatus for a marine vessel autopilot having an adjustable gain comprising:

instantaneous yaw means for providing a signal representative of instantaneous yaw motion of said vessel,

RMS yaw means responsive to said instantaneous yaw means for providing a signal representative of RMS yaw motion of said vessel,

first comparator means responsive to said RMS yaw signal for providing a first gain step control signal in accordance with first threshold levels exceeded by said RMS yaw signal,

second comparator means responsive to said instantaneous yaw signal for providing a second gain step control signal in accordance with second threshold levels exceeded by said signal representative of said instantaneous yaw, and

selector means for selecting said first or said second gain step control signal in accordance with the highest gain associated therewith, thereby providing a selected gain step control signal,

said selected gain step control signal being utilized to adjust said autopilot gain.

4,799,164

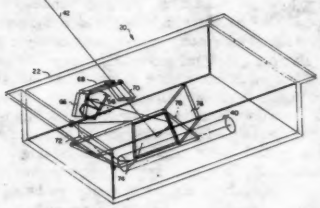
SHALLOW BAR CODE SCANNER

Ronald A. Helleksen, Eugene; Jorge L. Acosta, Veneta, both of Oreg., and John S. Campbell, Palo Alto, Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Sep. 12, 1986, Ser. No. 907,292

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—467 **34 Claims**



1. A low-profile laser scanner for reading bar codes positioned above the scanner, comprising:

a housing of shallow profile height, no more than about 13 cm in height, with a deck as a top surface;

a laser in the housing producing a beam to be scanned;

optical means within the housing, including a plurality of mirrors at least one of which is tilted downwardly to route

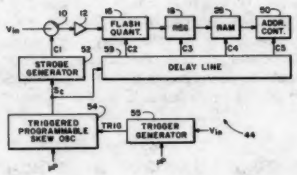
said beam to a bottom mirror which then reflect said beam in an upward direction for producing a five-apparent-source scan geometry within an optimum scan volume above the desk, the scan geometry including a center horizontal scan line, two side horizontal scan lines and two generally vertical scan lines, all generated within scanning planes at different angular orientations, produced within the confines of the shallow profile height of the housing.

4,799,165

LEVEL DETECTING WAVEFORM SAMPLING SYSTEM

Allen L. Hollister, Beaverton, and Edward L. Reuss, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 3, 1986, Ser. No. 835,417
Int. Cl.[4] G09G 1/00; H01J 29/98
U.S. Cl. 364—487 **9 Claims**



8. A method for determining a first time interval between a triggering event in a waveform and the moment that the magnitude of the waveform obtains a predetermined limit, the method comprising the steps of:

generating a periodic sampling control signal of a known frequency commencing at the end of an adjustable predetermined second time interval following a triggering even in a waveform;

sampling the waveform in response to each period of said periodic sampling control signal to produce a sequence of analog waveform samples representative of the magnitude of the waveform at the end of said predetermined second time interval and at regular intervals thereafter;

converting each said analog waveform sample into representative digital sample data;

generating an indicating signal when the digital sample data passes a predetermined limit;

providing a count of analog waveform samples produced; and

ascertaining the magnitude of said first time interval from the magnitude of said count at the moment said indicating signal is generated, from the frequency of the periodic sampling control signal, and from the duration of the second time interval.

4,799,166

APPARATUS FOR AUTOMATICALLY ANALYZING GASES IN OIL

Katsumi Shiono; Hideo Shinohara; Sadao Naito, and Goroo Ikeda, all of Ako, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

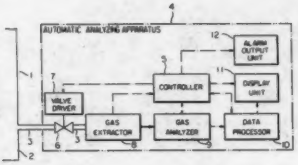
Continuation of Ser. No. 856,472, Apr. 28, 1986, abandoned. This application Mar. 2, 1988, Ser. No. 166,722
Int. Cl.[4] H02H 7/04
U.S. Cl. 364—497 **1 Claim**

1. An apparatus for automatically analyzing gases in oil comprising:

a gas extractor for deriving a slight amount of oil from an oil-immersed equipment to extract combustible gases contained therein in accordance with a sampling rate;

a gas analyzer for deriving the combustible gases extracted by the gas extractor to analyze the total quantity of the combustible gases or quantities of specified combustible gases; and

a data processor for storing results analyzed by the gas analyzer, for determining the trend of combustible gas quantities exceeding a predetermined value in the sample oil and the presence or absence of an abnormality in the oil-immersing equipment thereby, for compensating for errors in the results of the gas analyzer by performing statistical processing in which dispersion of data is considered, and for automatically adjusting the sampling rate of oil sampling and analytical processing routines on the basis of an increasing or decreasing trend of the analyzed results.

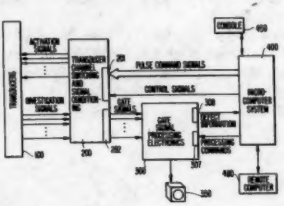


4,799,167

ULTRASONIC 64 CHANNEL INSPECTION SYSTEM WITH MULTIGATE/MULTIMODE SELECTION SOFTWARE CONFIGURABILITY

Dennis P. Sarr, Kent, Wash., assignor to The Boeing Company, Del.

Filed Dec. 31, 1985, Ser. No. 815,044
Int. Cl.[4] G01N 29/04
U.S. Cl. 364—507 **22 Claims**



19. A method of nondestructive ultrasonic testing of an object including the steps of:

sending ultrasonic energy to and receiving ultrasonic energy from said object;

transducing said received ultrasonic energy to form investigation signals;

selecting certain of said investigation signals to be gate signals;

processing said gate signals to obtain defect information; and

selecting certain of said defect information for subsequent processing.

4,799,168

DATA RECORDING APPARATUS FOR AN ULTRASONIC INSPECTION SYSTEM

Dennis P. Sarr, Kent, Wash., assignor to The Boeing Company, Del.

Filed Dec. 31, 1985, Ser. No. 815,050
Int. Cl.[4] G01N 29/04
U.S. Cl. 364—507 **11 Claims**

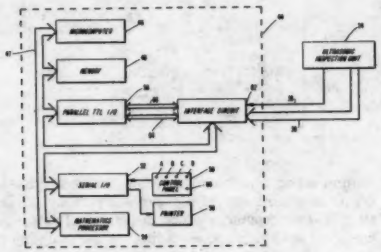
1. Ultrasonic inspection apparatus, comprising:

ultrasonic inspection means for generating ultrasonic inspection pulses, for supplying said pulses to a part being in-

spected, for producing an output signal proportional to the level of echo pulses received within a predetermined gate time window following generation of said inspection pulses, and for generating an alarm signal whenever said output signal exceeds a predetermined gate level;

means for storing a value of said output signal as a reference level;

means for receiving a plurality of operator-entered signals;



means for causing the currently produced value of said output signal to be stored as said reference level upon receipt of a first operator-entered signal and said alarm signal;

means for calculating the relationship between said reference level and said output signal upon receipt of a second operator-entered signal and said alarm signal; and

means for recording said relationship as an indication of a defect in a part being inspected.

4,799,169

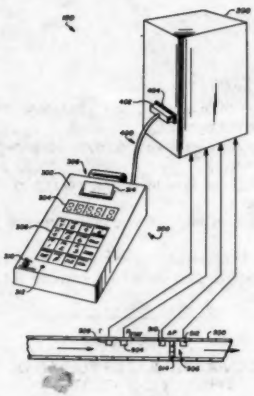
GAS WELL FLOW INSTRUMENTATION

Charles R. Mims, Sumrall, Miss., assignor to Mark Industries, Inc., Goshen, Ky.

Continuation of Ser. No. 56,271, May 26, 1987, abandoned, which is a continuation of Ser. No. 660,130, Oct. 12, 1984, abandoned. This application Feb. 24, 1988, Ser. No. 161,429

Int. Cl.[4] G01F *1/00*

U.S. Cl. 364—510 **15 Claims**



1. An apparatus for measuring gas flow comprising:

measuring means connected to a gas conduit at a fixed position thereof for producing periodic signals indicative of flow parameters of gas flowing through said conduit including means disposed within said conduit for restricting the cross sectional diameter thereof, having transducer means positioned on opposite sides of said restriction for producing periodic signals proportional to differential pressure across said restricting means;

computing means, connected to receive said periodic signals provided by said measuring means, for producing from said periodic signals indicia of the amount of gas flowing through said conduit over a first time interval greater than the periods of said periods signals and for producing indicia of the amount of gas flowing through said conduit over a plurality of different time intervals;

means for storing indicia of the amount of flow associated with each of said plurality of different time periods including means storing the values of numerical constants and measured gas flow characteristics used to produce said indicia of gas flow for each of said time periods to verify the accuracy of said produced indicia of gas flow; and

portable interrogating means, selectively connected to said storing means, and including means for initializing and calibrating said computing means to thereby assure accuracy of measurement and being selectively operable for extracting said stored indicia of the amount of flow associated with a selected one of said plurality of time intervals, and having means for selectively determining the length of each of said plurality of time intervals, said interrogating means including means for making a permanent digital record of said extracted indicia of the amount of flow.

4,799,170

METHOD OF MEASURING BY COORDINATE MEASURING INSTRUMENT

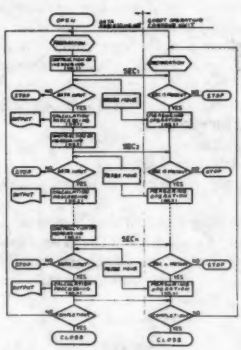
Tadao Nakaya, Utsunomiya, and Shinji Ide, Shimizu, both of Japan, assignors to Mitutoyo Mfg. Co. Ltd., Tokyo and Shimizu Kiden Co., Ltd., Shizuoka, both of, Japan

Filed Mar. 18, 1986, Ser. No. 841,104

Claims priority, application Japan, Mar. 19, 1985, 60-55092; Mar. 19, 1985, 60-55093

Int. Cl.[4] G06F *15/46;* G01B *5/20*

U.S. Cl. 364—513 **4 Claims**



1. In a method of measuring by a coordinate measuring instrument including a robot mechanism with driving means coupled to a detecting element for moving said detecting element in tri-dimensional directions to bring said detecting element into contact with a work to be measured rested on a mount, displacement detectors for detecting displacement values of said detecting element, and a data processing unit for processing an output signal from said displacement detectors in a predetermined manner to provide dimensions of said work, the method comprising the steps of:

uncoupling said detecting element from said driving means of said robot mechanism;

manually moving, during a detecting element moving step storing process, said detecting element along a sample of work to be measured rested on said mount in accordance

with a predetermined measuring step program, including a plurality of steps preset in said data processing unit; while, a moving path of said detecting element is detected by said displacement detectors, output signals from said displacement detectors are outputted to a robot operating command unit of said robot mechanism, said robot mechanism being independent of a main body of said coordinate measuring instrument, to thereby store the moving path of said detecting element in said robot operating command unit;

coupling said detector element to said driving means of said robot mechanism;

replacing said sample of work with a work to be measured;

operating said robot mechanism so that said driving means thereof will bring, during a measured data fetch process said detecting element into contact with said work to be measured in accordance with moving path data recorded in said robot operating command unit in response to each of the steps of said measuring step program, and simultaneously feeding output signals of said displacement detectors into said data processing unit;

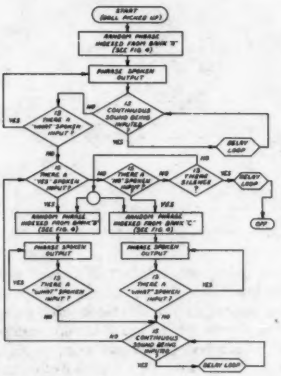
calculating, during a measured value calculating process, dimensions of said work on the basis of the measured data collected during said measured data fetch process and feeding a succeeding step exciting command to said robot operating command unit upon completion of the calculation; and

wherein said measured data fetch process and said measured data calculating process are repeated over all steps of said measuring step program so as to effect an automatic measuring task on different works to be measured.

4,799,171
TALK BACK DOLL

Charles A. Cummings, Cincinnati, Ohio, assignor to Kenner Parker Toys Inc., Beverly, Mass.

Continuation-in-part of Ser. No. 506,132, Jun. 20, 1983, abandoned. This application Nov. 21, 1983, Ser. No. 553,922
Int. Cl.[4] G10L 5/00
U.S. Cl. 364—513.5 **54 Claims**

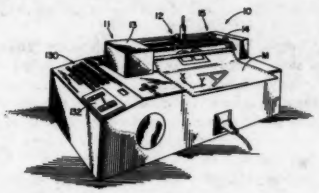


1. A talk back doll or toy figure comprising a microphone, a speech recognition unit connected to said microphone responsive to a predetermined band of frequencies contained in speech signals from said microphone, a battery, a normally open acceleration switch for actuating said speech recognition unit when said switch is momentarily closed by movement of said toy figure to condition said speech recognition unit for reception of speech-derived signals from said microphone, a speech synthesis unit controlled by said speech recognition unit for producing output signals representative of various preselected words in general accordance with said predetermined band of frequencies contained in said speech-derived signals, and speaker means connected to said speech synthesis unit for producing voice sounds derived from said output signals and containing therein a phrase composed of some of said preselected words.

4,799,172
APPARATUS AND METHOD FOR AUTOMATIC LAYOUT OF SIGN TEXT

Kenneth O. Wood, Ellington, and David J. Logan, Glastonbury, both of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Filed Apr. 30, 1986, Ser. No. 857,849
Int. Cl.[4] G01D 9/38
U.S. Cl. 364—518 **26 Claims**



1. A method for laying out a sign, said method comprising the steps of:

designating characters for first and second consecutive lines of sign text,

designating a height for each of said first and second lines of the sign text,

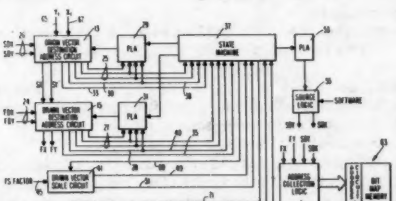
providing a spatial factor which corresponds to a general level of openness of the sign, and

spacing said first and second lines from one another by a spacing which is a function of the heights of said first and second lines of text and of said spatial factor.

4,799,173
TRANSFORMATION CIRCUIT TO EFFECT RASTER OPERATIONS

Robert C. Rose, Hudson, and Ned C. Forrester, Falmouth, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 28, 1986, Ser. No. 834,600
Int. Cl.[4] G06F 3/00
U.S. Cl. 364—518 **16 Claims**



1. A transformation circuit for reading a first plurality of pixel values corresponding to a source image from a first array of addresses in a bit map memory having rows and columns of addresses and writing a second plurality of pixel values corresponding to a transformed version of the source image into a second array of addresses in the bit map memory, each address

consisting of an X address component identifying a column in the bit map memory and a Y address component identifying a row, the source image being formed by a plurality of parallel source fast vectors originating along a source slow vector perpendicular thereto, and the transformed image being formed by a plurality of destination fast vectors originating along a destination slow vector, each destination fast vector being a transformation of a corresponding source fast vector and the destination slow vector being a transformation of the source slow vector, each vector comprising pixel values stored at a sequence of addresses, an address circuit being connected to the bit map memory, the address circuit accessing a selected address in the bit map memory in response to address signals, wherein the transformation circuit comprises the following:

(a) slow vector destination address circuitry (13) for outputting a sequence of addresses at which the pixel values representing the destination slow vector are to be stored as a function of the X and Y components of the first address and the X and Y extents of the destination slow vector;

(b) fast vector destination address circuitry (15) connected to the slow vector destination address circuitry for outputting a sequence of addresses at which the pixel values representing a destination fast vector are to be stored as a function of the address output by the slow vector destination address circuitry and the X and Y extents of a destination fast vector;

(c) source logic circuitry (55) for outputting the first array of addresses in sequence;

(d) switching circuitry (29, 31, 53) connected to the slow vector destination address circuitry, the fast vector destination address circuitry and the source logic circuitry for outputting switching signals for determining the sequence of addresses output by the slow vector destination address circuitry, the fast vector destination address circuitry and the source logic circuitry respectively;

(e) control circuitry (37) connected to the switching circuitry, the slow vector destination address circuitry and the fast vector destination address circuitry for outputting contol signals to the switching circuitry in response to status signals from the destination address circuitry; and

(f) address collection circuitry (50) connected to the source logic circuitry (55), the fast vector destination address circuitry (15) and the address circuit (59) for multiplexing the addresses output by the source logic circuitry and the fast vector destination address circuitry to the address circuit (59).

4,799,174

MULTIPLE SET POINT CONDITION MONITORING SYSTEMS

L. Jonathan Kramer, Warminster, and Steven R. Petersen, Ambler, both of Pa., assignors to Drexelbrook Controls, Inc., Horsham, Pa.

Continuation of Ser. No. 839,794, Mar. 13, 1986, abandoned. This application Oct. 23, 1987, Ser. No. 113,358

Int. Cl.[4] G01F *23/26*

U.S. Cl. 364—550 **24 Claims**

1. A system for monitoring a specified condition of materials at multiple set points comprising:

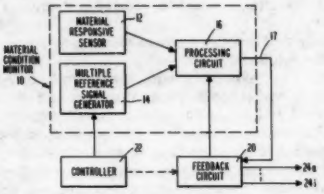
comparison means having a pair of inputs;

material sensing means comprising a single admittance probe coupled to one of the inputs of the comparison means for providing an admittance indicative of the condition of the materials;

sequential admittance generator means coupled to the other input of the comparison means for automatically and repeatedly providing a plurality of different admittance values, each admittance value corresponding to a different set point;

detector means coupled to the comparison means for detecting a difference between the admittance provided by the material sensing means and each of the admittances provided by the sequential admittance generator and providing an output indicative thereof;

storage means coupled to the detector means for storing indications of differences detected by the comparison means for each admittance value provided by the sequential admittance generator means;



output means coupled to the storage means for providing a plurality of output signals, each output signal corresponding to at least one of the indications stored by the storage means; whereby each output signal represents a relationship between at least one of the multiple set points and the condition of the materials indicated by the material sensing means.

4,799,175

SYSTEM FOR INSPECTING PATTERN DEFECTS OF PRINTED WIRING BOARDS

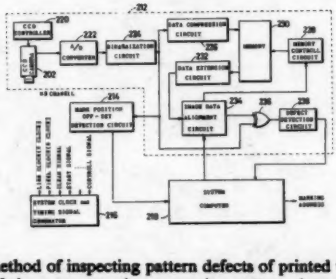
Tetsuo Sano; Tetsuo Hohki, both of Kyoto; Eiji Kodama, Higashi-Osaka; Takumi Yoshida, Kusatsu; Masafumi Kawatani, Takatsuki, and Hisayuki Tsujinaka, Kyoto, all of Japan, assignors to Dainippon Screen Mfg., Co., Kyoto, Japan

Filed May 10, 1985, Ser. No. 733,506

Claims priority, application Japan, Jun. 12, 1984, 59-120992

Int. Cl.[4] H04N *7/00*

U.S. Cl. 364—552 **17 Claims**



1. A method of inspecting pattern defects of printed wiring boards of the same type by comparing pattern data of said printed wiring boards, said method comprising the steps of:

placing a first printed wiring board having positioning marks being in prescribed positional relation to positioning marks of a wiring pattern on a table driven in a sub scanning direction;

reading said marks of said first printed wiring board to find the amount of deviation of said first printed wiring board with respect to a reference position in an inspection system and thereafter performing image acquisition of an inspected area of said first printed wiring board by sequential scanning thereby to store obtained pattern data in a memory unit;

placing a second printed wiring board having the same positioning marks as said marks on said table;

reading said marks of said second printed wiring board thereby to find the amount of deviation of said second

printed wiring board with respect to said reference position in said inspection system in order to find an amount of relative misregistration between said second printed wiring board with respect to said first printed wiring board by comparing the read marks of said first and second printed wiring boards; and

controlling reading of pattern data of said first printed wiring board stored in said memory unit on the basis of said amount of said relative misregistration when said inspected area of said second printed wiring board is subjected to image acquisition while controlling arrangement of said read pattern data thereby to compare both pattern data in pixel data correspondence on the basis of pattern data of said second printed wiring board obtained by sequential scanning.

4,799,176

ELECTRONIC DIGITAL THERMOSTAT

Joseph J. Cacciatore, Westmont, Ill., assignor to Harper-Wyman Company, Hinsdale, Ill.

Filed Dec. 29, 1986, Ser. No. 946,830
Int. Cl.[4] F23N *5/20*; G06F *15/20*
U.S. Cl. 364—557 **15 Claims**

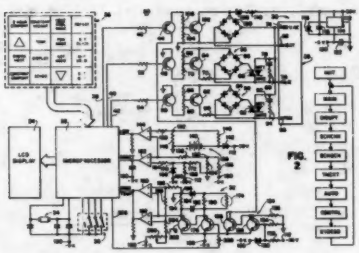


FIG. 2

5. A programmable electronic digital thermostat for controlling a temperature conditioning system to maintain a scheduled set ambient temperature, said thermostat comprising:

controlled semiconductor switch means for selectively activating and deactivating the temperature conditioning system;

a microprocessor for storing a program and for performing logical control operations in accordance with said stored program;

temperature sensing means coupled to said microprocessor for providing a pulse width modulated PWM signal representative of ambient temperature in response to an enable control signal from said microprocessor said PWM temperature signal applied to said microprocessor;

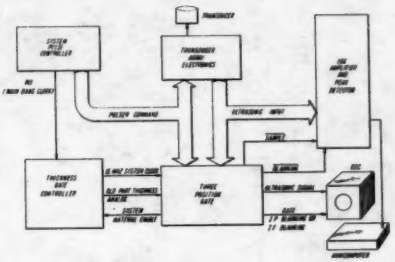
said microprocessor being cooled to said controlled semiconductor switch means and generating control signals for activating and deactivating said semiconductor switch means in response to a determined temperature difference between said PWM temperature signal and a dynamically adjusted temperature control signal, said dynamically adjusted temperature control signal being set to one of an initial minimum or maximum value relative to said scheduled set ambient temperature in response to each of said microprocessor generated control signals for activating and deactivating said semiconductor switch means, said temperature control signal being adjusted in discrete steps toward said set ambient temperature after an elapsed variable time interval.

4,799,177

ULTRASONIC INSTRUMENTATION FOR EXAMINATION OF VARIABLE-THICKNESS OBJECTS

Dennis P. Sarr, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1985, Ser. No. 815,038
Int. Cl.[4] G01N *29/00*
U.S. Cl. 364—563 **26 Claims**



1. An apparatus for ultrasonic inspection of a part comprising:

means for generating a transmission signal;

a plurality of transducer channels, coupled to said transmission signal generating means, for generating ultrasonic pulses for transmission into said part, for receiving portions of said ultrasonic pulses from said part, and for creating electrical reflection signals representing said portions, one of said transducer channels being a thickness transducer channel and including means for determining a part thickness value representing the thickness of a portion of said part adjacent said thickness transducer channel;

means, coupled to each of said transducer channels, for measuring the amplitude of said electrical reflection signals only during a time window corresponding to said part thickness value; and

thickness gating means, coupled to said measuring means, for automatically replacing said part thickness value with a subsequently determined part thickness value, and thereby adjusting said time window, according to electrical reflection signals received by said thickness transducer channel only if said subsequently determined part thickness value differs from said part thickness value by less than a predetermined difference value.

4,799,178

METHOD AND APPARATUS FOR DETECTING ROTATIONAL SPEED

Peter J. Spadafora, Kokomo; Jill G. Hersberger, Galveston; Myron H. Bell, Indianapolis, and Robert L. Harding, Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed May 26, 1987, Ser. No. 54,292
Int. Cl.[4] G01P *3/36*
U.S. Cl. 364—565 **6 Claims**

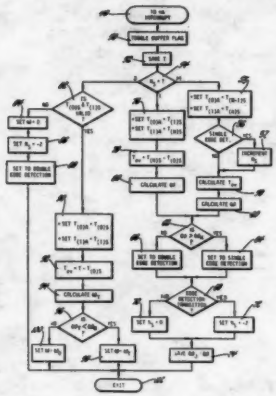
1. A system for measuring the speed of a rotating member, the system comprising, in combination:

means for generating a speed signal for each predetermined angular rotation of the member, the generated speed signals having a frequency directly proportional to the rotational speed of the member;

means for counting the number of speed signals generated during each of successive sampling intervals; and

means effective at the end of each sampling interval for (A) determining the elapsed time from the next-to-last speed signal generated in the prior sampling interval to the last speed signal generated, the elapsed time comprising a calculation interval and (B) dividing the calculation interval by one greater than the number of speed signals

counted during the sampling interval to obtain the average time between speed signals, the average time being a measure of the speed of the rotating member, whereby



successive calculation intervals overlap so as to minimize the influence of one speed signal on successive determinations of the speed of the rotating member.

4,799,179

SIGNAL ANALYSING AND SYNTHESIZING FILTER BANK SYSTEM

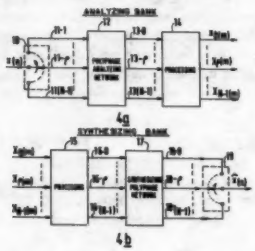
Jacques L. R. Masson, Chatou, and Zdenek Picel, Velizy, both of France, assignors to Telecommunications Radioelectriques et telephoniques T.R.T., Paris, France

Filed Jan. 27, 1986, Ser. No. 822,503

Claims priority, application France, Feb. 1, 1985, 85 01429

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—724.1 **5 Claims**



1. A digital signal processing system comprising:

a. an analysing filter bank for dividing an incoming signal, sampled at a rate f_3 and occupying a frequency band limited to $f_e/2$, into N contiguous subband signals having respective bandwidths of $f_e/2N$ and which are sampled at a rate f_e/N, said analyzing filter bank comprising N prototype low-pass filters, one for each subband and arranged in parallel along N respective branches, each prototype filter:

i. having a same finite and symmetrical impulse response;

ii. having a beginning-of-attenuation-band frequency f_a less than $f_e/2N$; and

iii. satisfying the condition $H^2(f)+H^2(f_e/2N-f)=1$ in a band of frequencies f extending from 0 to f_a, where H(f) is the absolute value of the frequency response to each prototype filter; and

iv. comprising a modulation input for receiving a modulation signal, each modulation signal having:

A. a frequency $f_k=(2k+1)f_e/(4N)$, where k is an integer, running from 0 N−1, representing a respective one of the N subbands;

B. a phase α_k, such that α_0 is equal to one of $\pi/4$, $3\pi/4$, $5\pi/4$, and $7\pi/4$, and such that for two contiguous subbands represented by k and k−1, the difference $\alpha_k-\alpha_{k-1}$ is equal to one of $\pi/2$ and $-\pi/2$; and

C. a time delay $\tau=(N_c-1)/(2f_e)$, where N_c is a number of coefficients required for realizing the prototype filter; and

b. a synthesizing filter bank for recoovering said incoming signal from said subband signals, said synthesizing filter bank comprising N prototype low-pass filters which are the same as the prototype filters used in the analyzing filter bank, except that the phase of the modulation signals is $-\alpha_k$,

whereby the number N is any integer greater than or equal to 2 and whereby N_c is not constrained to be a multiple of N.

4,799,180

ADAPTIVE AUTOMATIC EQUALIZER

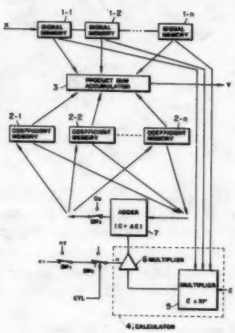
Mitsuo Suzuki, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 30, 1986, Ser. No. 924,808

Claims priority, application Japan, Oct. 31, 1985, 60-245204

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—724.2 **7 Claims**



1. An adaptive automatic equalizer comprising:

a plurality of signal memory means for delaying an input signal at a plurality of stages;

a plurality of coefficient memory means for storing weighting coefficients to be applied to said input signal at respective delay stages, each of said coefficient memory means corresponding to a respective one of said signal memory means;

product sum accumulating means for multiplying said input signal stored in each of said signal memory means with said weighting coefficients stored in respective ones of said coefficient memory means at respective delay stages, and for accumulating respective products thus obtained so as to produce a signal based on the result of the accumulation as a corrected input signal whose distortion is corrected;

calculating means for calculating at respective delay stages a correction value for said weighting coefficients stored in said coefficient memory means based on a difference signal between an output signal of said product sum accu-

mulating means and a desired signal, wherein said calculating means includes a multiplier for multiplying a difference between said input signal corrected by said product accumulating means and said desired signal with a complex conjugate of the input signals stored in said signal memory means and the correction rate of said weighting coefficient at each delay state of said input signal, thereby obtaining a correction value of the weighting coefficient for each delay stage;

correcting means for correcting said weighting coefficients in accordance with the correction value calculated by said calculating means;

detecting means for detecting a rapid change of said input signal; and

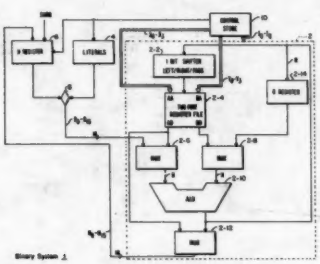
means for inhibiting a substantial correction of said weighting coefficients to be effected by said correcting means when said rapid change is detected by said detecting means during an interval between said rapid change of said input signal and return of said input signal to a stable state.

4,799,181

BCD ARITHMETIC USING BINARY ARITHMETIC AND LOGICAL OPERATIONS

Steven A. Tague, Billerica, and William E. Woods, Natick, both of Mass., assignors to Honeywell Bull Inc., Minneapolis, Minn.

Filed Sep. 30, 1986, Ser. No. 913,810
Int. Cl.[4] G06F 7/38
U.S. Cl. 364—736 **36 Claims**



13. Apparatus for performing an arithmetic operation on binary coded decimal (BCD) operands comprising:

a control store for generating control signals, address signals and operands;

first means coupled to said control store and responsive to said control signals, said address signals and a first of said operands for converting each digit of a first BCD operand and a second BCD operand to a hexadecimal excess 3 digit to form a second operand and a third operand respectively;

second means coupled to said control store and said first means and responsive to said control signals and said address signals for adding corresponding hexadecimal excess 3 digits of said second and said third operands to generate a partial result;

third means coupled to said control store and said first and said second means and responsive to said control signals and said address signals for generating a first hexadecimal digit value in each digit position from which a carry resulted from the addition of said second and said third operands and generating a second hexadecimal digit value in each digit position from which no carry resulted; and

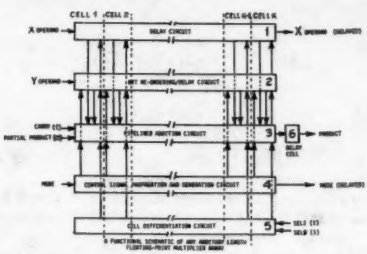
fourth means coupled to said control store, said second means and said third means and responsive to said control signals and said address signals for adding said first and said second hexadecimal digit values to corresponding digit positions of said partial result and adding binary ONE to generate a final result.

4,799,182

CELLULAR FLOATING-POINT SERIAL PIPELINED MULTIPLIER

Warren Marwood, Fairview Park, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU85/00249, § 371 Date Jun. 16, 1986, § 102(e) Date Jun. 16, 1986, PCT Pub. No. WO86/02474, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 16, 1985, Ser. No. 882,935
Claims priority, application Australia, Oct. 16, 1984, PG7661
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—748 **11 Claims**



1. A cellular floating-point serial pipe-lined multiplier arranged to accept two synchronous digit serial data streams having bits representing mantissas and exponents of respective X and Y operands in floating-point format and to output one identically formated data stream which is the floating-point product of the synchronous X and Y operands, comprising:

an X operand delay circuit for delaying said X operand to provide a delayed X operand;

a bit re-ordering/delay circuit for reversing and storing a bit of a mantissa of said Y operand and delaying an exponent of said Y operand so as to be in time synchronism with the exponent of said delayed X operand;

pipe-lined addition means for adding the exponent of said delayed X operand and the delayed exponent of said Y operand in an addition mode and for multiplying the mantissa of said delayed X operand and the bit-reversed Y operand in a multiplication mode so as to produce said floating-point product; and

mode control signal propagation and generation means for identifying whether each received bit of said X and Y operands are mantissa or exponent bits and for outputting a mode signal for respectively placing said pipe-lined addition means and said bit re-ordering/delay circuit in said multiplication mode or said addition mode in response to said identification for each bit.

4,799,183

VECTOR MULTIPLIER HAVING PARALLEL CARRY SAVE ADDER TREES

Hiraku Nakano, and Hiroshi Murayama, both of Hadano, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Oct. 20, 1986, Ser. No. 920,600
Claims priority, application Japan, Oct. 24, 1985, 60-237884
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—760 **5 Claims**

1. A multiplier comprising:

(a) a multiplicand register for receiving a multiplicand;

(b) a multiplier register operable to store a plurality of bits, for receiving a multiplier;

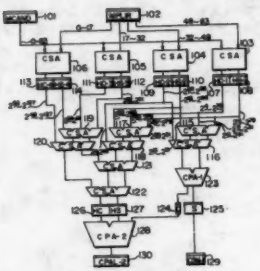
(c) a plurality of multiple generation means for generating a plurality of multiples of said multiplicand at the same time,

each of said plurality of multiple generation means connected to said multiplicand register and a different group of said bits of said multiplier register;

(d) carry save adder tree means for adding the outputs of said multiple generation means;

(e) low order arithmetic operation means connected to said carry save adder tree means for carrying out carry propagation addition of low order bits of a product of said multiplicand and said multiplier; and

(f) high order arithmetic operation means connected to said carry save adder tree means and said low order arithmetic means for carrying out carry propagation addition of higher order bits of the product of said multiplicant and said multiplier.



4,799,184

CONVOLVER ARANGEMENT WITH ACOUSTIC WAVES

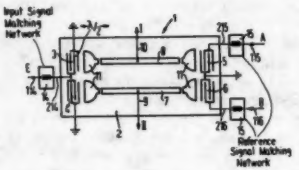
Hans P. Grassl, Zornding, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 20, 1986, Ser. No. 898,375

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529902

Int. Cl.[4] G06G *7/195, 7/12;* H01L *41/08*

U.S. Cl. 364—821 **10 Claims**



1. A convolver arrangement in which acoustic waves run in a surface of a substrate member, comprising:

first and second integration electrodes with respective first and second input signal interdigital transducers arranged at one end of each of the respective first and second integration electrodes, and first and second reference signal interdigital transducers at respective opposite ends of the two integration electrodes, and wherein a single input signal is connected to a parallel connection of the first and second input signal interdigital transducers, and first and second reference signals are connected to the respective first and second reference signal interdigital transducers so that convolution of only one input signal with two reference signals is provided;

the first and second integration electrodes each having respective first and second convolution signal outputs;

each of the first and second input signal interdigital transducers having a same first input impedance, and each of the individual reference signal interdigital transducers having a same second input impedance;

the first and second input impedances being chosen such that an input impedance of the parallel connection of the first and second input signal interdigital transducers has approximately a same value as said same second input impedance of each of the individual reference signal interdigital transducers;

both the input signal and reference signal interdigital transducers having a fundamentally similar design structure except that the reference signal interdigital transducers are split-finger interdigital transducers with alternating finger pairs, whereas the input signal interdigital transducers are like split-finger interdigital transducers with finger pairs but wherein one of the fingers of each pair is provided as a floating finger through provision of an electrical interruption of the floating finger relative to a respective bus bar to which it would normally connect, but for the electrical interruption.

4,799,185

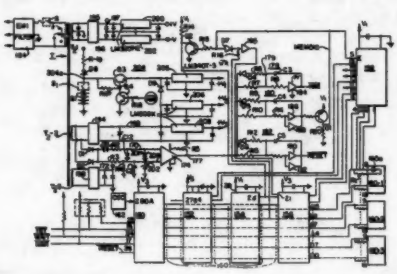
PROTECTIVE CIRCUIT FOR MEMORY DEVICES

Lawrence D. Taylor, Lansdale, Pa., assignor to Brandt, Inc., Bensalem, Pa.

Division of Ser. No. 699,055, Feb. 7, 1985. This application Mar. 27, 1986, Ser. No. 844,888

Int. Cl.[4] G06F *12/16*

U.S. Cl. 364—900 **15 Claims**



1. Apparatus for protecting the contents of a plurality of memory devices in a microprocessor system comprising a central processing unit, bus means and a plurality of memory devices communicating with said unit through said bus means, each of said memory devices having a power supply voltage input terminal and a disabling input terminal, said apparatus comprising:

a power source generating an A.C. output;

means for converting the output of said A.C. power source to a D.C. signal;

a D.C. battery source;

a common terminal for coupling D.C. power to the power supply voltage input terminal of at least one of said memory devices;

said D.C. signal being coupled to said common terminal;

said battery source being coupled to said common terminal through first switch means;

said switch means being normally open and including a control input for selectively coupling said battery to said common terminal;

first means responsive to the D.C. signal of said converting means for generating a first control signal, a first predetermined time interval after said D.C. signal has dropped to a predetermined level;

said control input being responsive to said first control signal for closing the normally open switch means;

second means responsive to said D.C. signal for generating a

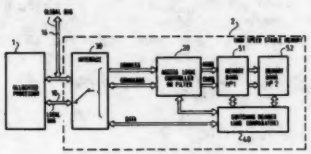
second control signal a second predetermined time interval after said D.C. signal has dropped to said predetermined level and means responsive to said second control signal for coupling the disabling input terminals of said memory devices to said battery source, said second predetermined time interval being greater than said first predetermined time interval whereby battery power is applied to said memory devices before said memory devices are disabled to permit said central processing unit to save operating information.

4,799,186

ELECTRONIC CIRCUIT CONSTITUTING AN IMPROVED HIGH-SPEED STABLE MEMORY WITH MEMORY ZONES PROTECT FROM OVERLAP

Florimond E. Ployette, Rennes, France, assignor to Inria Institut National de Recherche en Informatique et en Automatique, Le Chesnay, France

Filed Dec. 12, 1986, Ser. No. 941,212
Claims priority, application France, Dec. 12, 1985, 85 18437
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 **22 Claims**



1. A high-speed stable memory-type electronic circuit, comprising:

interface means having an address interface, a data input-/output interface, and a write and read command interface for connection to an external processor;

first and second memory assemblies, each of the assemblies being independent non-volatile read/write memory assemblies having address inputs, read/write control inputs, and data inputs/outputs;

access control means connected firstly to an address interface and to a write and read instruction interface, and secondly to the address inputs and to the read/write control inputs of the first and second memory assemblies in order to establish access authorization only to a designated portion of the first and second memory assemblies on each occasion that a designated read or write operation is to be performed, said access authorization being destroyed after said memory portion has been addressed;

the access control means comprising a logic controller and a first non-volatile auxiliary memory containing partitioning information suitable for splitting each of the memory assemblies identically into at least one level of disjoint sub-assemblies, referred to as "objects" and wherein

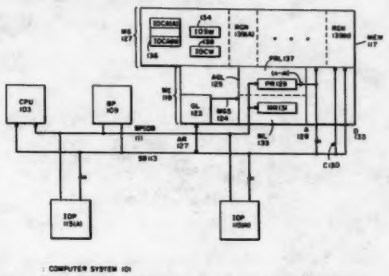
the logic controller splits each request for access to the memory from the external processor into one or more active access states, in each of which it verifies that a sequence of addresses applied to a memory assembly covers a complete subassembly (or object) as defined by the partitioning information, with any anomaly giving rise to the logic controller moving to an error state.

4,799,187

MEMORY ADDRESS GENERATOR WITH DEVICE ADDRESS TYPE SPECIFIER

Jeffrey W. Einarson, Lowell, and Kin-Ling Cheung, North Andover, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Jul. 30, 1987, Ser. No. 80,722
Int. Cl.[4] G06F *12/00, 13/36*
U.S. Cl. 364—900 **9 Claims**



2. Address generating apparatus for generating n-bit addresses for use in a digital computer system in which a computer system memory and a plurality of devices are connected to a system bus having address lines for carrying addresses of at least n bits, the devices may contend for access to the system bus and access is granted thereto by bus grant logic, and first certain of the devices generate addresses containing m bits where $m<n$ and second certain of the devices generate addresses containing n bits,

the address generating apparatus comprising:

device address type specification means for specifying whether a given device generates m-bit addresses or n-bit addresses;

address prefix storage means coupled tot he system bus for storing an $(n-m)$-bit prefix for each of the devices; and

prefix outputting means connected to the address prefix storage means and responsive to the bus grant logic and to the device address type specification means for causing the prefix for the device which currently has access to the system bus to be output from the address prefix storage means to the address lines carrying the $(n-m)$ most significant bits of the memory address when the device address type specification means indicates that that device generates m-bit addresses.

4,799,188

ELECTRONIC DICTIONARY SYSTEM HAVING IMPROVED MEMORY EFFICIENCY FOR STORAGE OF COMMON SUFFIX WORDS

Motokazu Yoshimura, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 18, 1986, Ser. No. 840,662
Claims priority, application Japan, Mar. 23, 1985, 60-58776
Int. Cl.[4] G06F *15/00, 13/00*
U.S. Cl. 364—900 **1 Claim**

1. A system for checking a spelling of an input English word comprising:

an input means for inputting an English word;

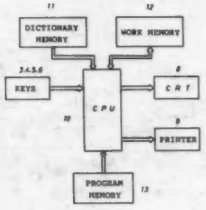
an electronic dictionary memory for storing English words in four groups, wherein every word in each group can have a common suffix and is stored without the suffix, and the four groups include a first group of words that can have a suffix "s"; a second group of words that can have a suffix "s", "ing", or "ed"; a third group of words that can have a suffix "ly"; and a fourth group of other words;

a search means for searching whether or not an input word exists in the dictionary memory;

a suffix judgement means for judging whether or not an

input word has one of the suffixes by which words in the dictionary memory are classified and, if the input word has one of the suffixes, for eliminating the suffix of the input word and for cooperating with the search means to search for word data in the dictionary memory coincident with a de-suffixed form of the input word within the group corresponding to the suffix,

wherein if the input word does not have one of the suffixes by which the words in the dictionary are classified, or if



word data coincident with the de-suffixed form of the input word does not exist within the group corresponding to the suffix, the search means searches for word data in the dictionary memory coincident with the input word; and

an output means for displaying the input word and, if word data coincident with the input word or de-suffixed form of the input word does not exist in the dictionary memory, for displaying the input word distinctively.

4,799,189

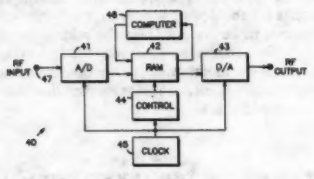
RESYNTHESIZED DIGITAL RADIO FREQUENCY MEMORY

R. Kent Grover, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 26, 1985, Ser. No. 759,216

Int. Cl.[4] G11C *27/00*

U.S. Cl. 364—900 **4 Claims**



1. A resynthesized digital radio frequency memory (DRFM) for accurately representing an RF input signal utilizing a short pulse sampling signal of insufficient width to represent the input signal frequency, said digital radio frequency memory comprising:

an analog-to-digital converter having an RF input, a clock input and an output;

memory means for storing a first digital pattern, a second digital pattern and an interpulse digital pattern, said memory means having a first input, a second input, a first output, a second output and a control line, said first input being coupled to said output of said analog-to-digital converter, said memory means operating to store said first, second and interpulse digital patterns contiguously from a starting address to stopping address;

a digital-to-analog converter having an input, a clock input and an RF output, said input being coupled to said first output of said memory means;

control means for controlling the starting and stopping addresses for said digital patterns stored in said memory means, said control means having a clock input and an output, said output being coupled to said control line of said memory means;

timing means for timing the resynthesized DRFM, said timing means having an output coupled to said clock input of said analog-to-digital converter, to said clock input of said digital-to-analog converter, and to said clock input of said control means, said timing means operating to produce a timing frequency signal for said sampling of said RF input at a fractional ratio; and

computer means for generating an interpulse digital pattern from said first digital pattern and finding and correcting errors resulting from said sampling at a fractional ratio of said RF input signal utilizing said timing frequency signal, said timing frequency signal and said RF input signal being non-multiples, said generating including comparing said interpulse digital pattern with said second digital pattern and altering said interpulse digital pattern so that said first digital pattern and said second digital patterns match bit-for-bit for correcting a phase relationship of said first and second digital patterns to accurately represent said RF input signal, said computer means having an input and an output, said input being coupled to said second output of said memory means and said output being coupled to said second input of said memory means.

4,799,190

DATA SELECTION CIRCUITS, SYSTEMS AND METHODS

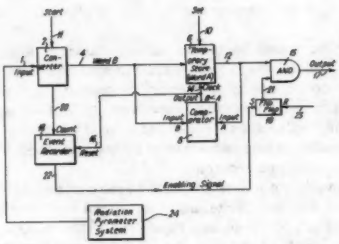
Joseph Douglas, Belper, and Richard P. Jennings, Marlborough, both of England, assignors to ROLLS-ROYCE plc, London, England

Continuation of Ser. No. 777,572, Sep. 19, 1985, abandoned, which is a continuation of Ser. No. 139,276, Apr. 10, 1980, abandoned, which is a continuation of Ser. No. 847,803, Nov. 2, 1977, abandoned. This application Jan. 21, 1987, Ser. No. 6,342

Claims priority, application United Kingdom, Nov. 12, 1976, 47154/76

Int. Cl.[4] G06F *07/02*

U.S. Cl. 364—900 **3 Claims**



1. A radiation pyrometer system for measuring a radiance of at least a portion of an object moving repetitively through a field of view comprising:

means for detecting the radiance from at least a portion of said object as said object repetitively moves through said field of view;

means for converting said detected radiance to a series of data words, each of said data words representing the value of said detected radiance at a given time;

a temporary data store communicating with said converting means for storing said data words and being resettable to an initial state representing an initially stored data word of predetermined value, said temporary data store having an input and an output;

a controlling means communicating with the input and output of said temporary data store for controlling entry of input data words into said temporary data store from said

converting means, said controlling means receiving from the output of said temporary data store the data word stored thereby, receiving from the input of said temporary data store each of said input data words and comparing, according to a predetermined criterion, the value of each input word with the value of the data words stored in said temporary data store and if the value of an input data word meets said criterion, said controlling means outputting a control signal to said temporary data store to cause said temporary data store to discard said stored data word and replace same with said input data word, said criterion being that said input data word is different from the stored word and that its difference be in a predetermined direction;

an AND gate for gating the data word stored in said temporary data store to said output;

a flip-flop connected to said AND gate for enabling said AND gate to pass said data word from said temporary data store to said output; and

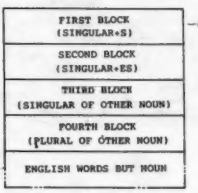
a resettable counter means for counting the number of input data words generated by said converting means and for enabling said gate means to control said flip-flop to output said stored data word, said resettable counter means being reset by said output control signal from said controlling means wherein said resettable counter means is reset to zero by said output control signal from said controlling means each time said control signal is outputted, said resettable counter means controlling said flip-flop to enable said AND gate whenever said resettable counter means counts the generation of a predetermined number of said input data words without being reset.

4,799,191

MEMORY SAVING ELECTRONIC DICTIONARY SYSTEM FOR SPELL CHECKING BASED ON NOUN SUFFIX

Motokazu Yoshimura, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 18, 1986, Ser. No. 840,660
Claims priority, application Japan, Mar. 20, 1985, 60-56417
Int. Cl.[4] G06F *15/40*
U.S. Cl. 364—900 **3 Claims**



1. A system for checking a spelling of an input English noun word comprising:

an input means for inputting an English word;

a dictionary memory for storing a plurality of English words which are classified into a first group and a second group, said first group including noun words and said second group including non-noun words, the noun words being stored in a specified memory region storing only noun words in the dictionary memory, said memory region being divided into four blocks including a first block of words whose plural forms can have a common suffix "s"; a second block of words whose plural forms can have a common suffix "es"; a third block of other words of singular form; and a fourth block of words each of which is a plural form of each word in the third group;

a search means for searching whether or not an input word exists in the dictionary memory;

a suffix judgment means for judging whether or not an input word which does not exist in the dictionary memory has a possessive suffix and, if the input word has a possessive suffix, for searching through the first group in the dictionary memory to find, in cooperation with the search means, word data coincident with the input word without the possessive suffix; and

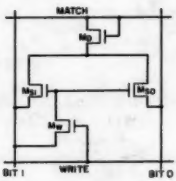
an output means for displaying the input word and indicating whether or not the input word is spelled correctly.

4,799,192

THREE-TRANSISTOR CONTENT ADDRESSABLE MEMORY

Jon P. Wade, Boston, and Charles G. Sodini, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 28, 1986, Ser. No. 901,514
Int. Cl.[4] G11C *15/04*
U.S. Cl. 365—49 **6 Claims**



1. A content addressable memory cell comprising:

a p-type storage transistor coupled to a first bitline and an n-type storage transistor coupled to a second bitline, the storage transistors having their gates connected in common for storing a potential thereon; and

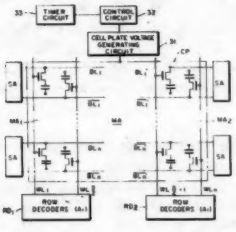
a write transistor coupled between the commonly connected gates of the storage transistors and one of the bitlines to transmit a potential, which is presented on said one of the bitlines for storage onto the gates of the storage transistors.

4,799,193

SEMICONDUCTOR MEMORY DEVICES

Fumio Horiguchi; Yasuo Itoh, both of Kawasaki; Mitsugi Ogura, and Masaki Momodomi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 9, 1986, Ser. No. 917,042
Claims priority, application Japan, Oct. 9, 1985, 60-225353
Int. Cl.[4] G11C *11/24*
U.S. Cl. 365—149 **33 Claims**



1. A semiconductor memory device, comprising:

at least one memory cell array block with a plurality of memory cells formed at the surface of a semiconductor substrate, each memory cell comprises a transistor and memory capacitor;

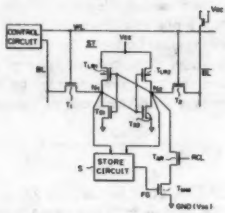
a plurality of word lines for addressing said memory cells;
a plurality of bit lines for reading from and writing to said memory capacitors;
at least one cell plate formed on said semiconductor substrate, said cell plate forming a common electrode of said memory capacitors;
cell plate voltage generating means for supplying a voltage of a level between a supply voltage and a ground voltage to said cell plate; and
control means for controlling an output impedance of said cell plate voltage generating means,
wherein said output impedance of said cell plate voltage generating means is lowered for a predetermined period, and a time constant of the cell plate voltage generating means during said predetermined time is smaller than thirty times as a cycle time of said memory cells.

4,799,194

SEMICONDUCTOR RANDOM ACCESS NONVOLATILE MEMORY DEVICE WITH RESTORE AND CONTROL CIRCUITS

Hideki Arakawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 20, 1987, Ser. No. 16,729
Claims priority, application Japan, Feb. 27, 1986, 61-042383
Int. Cl.[4] G11C *11/34, 7/00, 11/00*
U.S. Cl. 365—154 **9 Claims**



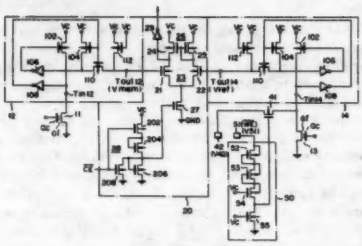
1. A semiconductor nonvolatile memory device comprising:
a pair of bit lines;
a plurality of word lines;
decoder means, coupled to said plurality of word lines, for selecting one of said word lines;
first and second transfer gate transistors having gates connected to one of said word lines;
a plurality of memory cells, each of said memory cells including:
a static memory cell including a flip-flop having first and second terminals connected between said pair of bit lines by way of said first and second transfer gate transistors; and
a nonvolatile memory cell connected to said first and second terminals of said flip-flop; and
a control circuit, operatively connected to said word lines, one of said bit lines and said decoder means, for selecting all of said word lines, turning on said first and second transfer gate transistors in said memory cells when information stored in said nonvolatile memory cell is recalled to said static memory cell, and supplying a predetermined potential to said flip-flop through said bit lines, said first and second transfer gate transistors making said flip-flop a predetermined state.

4,799,195

SEMICONDUCTOR MEMORY DEVICE WITH A SENSE AMPLIFIER

Hiroshi Iwahashi, Yokohama, and Masamichi Asano, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 822,205, Jan. 24, 1986, abandoned. This application Mar. 4, 1988, Ser. No. 168,560
Claims priority, application Japan, Jan. 26, 1985, 60-13069
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 **6 Claims**



1. A semiconductor memory device comprising:
a memory cell including a first MOS floating gate transistor, a predetermined voltage being applied to a drain-source path of said first transistor and a first control signal being applied to a gate of said first transistor;
a dummy cell including a second MOS floating gate transistor, a predetermined reference voltage being applied to a drain-source path of said second transistor and a second control signal being applied to a gate of said second transistor;
a third MOS transistor having a drain-source path thereof coupled to said dummy cell and to a voltage source, and having a gate thereof supplied with a third control signal, said third MOS transistor transferring said predetermined reference voltage from said voltage source to said dummy cell in response to said third control signal; and
a sense amplifier for comparing a read out voltage from said memory cell with said predetermined reference voltage.

4,799,196

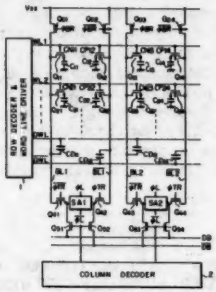
SEMICONDUCTOR MEMORY DEVICE COMPRISING DIFFERENT TYPE MEMORY CELLS

Yoshihiro Takemae, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 24, 1987, Ser. No. 17,652
Claims priority, application Japan, Feb. 28, 1986, 61-043083
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—190 **6 Claims**

1. A semiconductor memory device comprising:
a plurality of word lines and a plurality of bit lines;
a plurality of memory cells connected between one of said word lines and one of said bit lines, said plurality of memory cells including memory cells of a first type having an N channel type transfer gate transistor of a second type having a P channel type transfer gate transistor, each of said word lines being connected to at least one of said memory cells of said first type and at least one of said memory cells of said second type; and
applying means for applying a selection signal to a selected

word line, the selection signal having one of two opposite polarities in accordance with an access to said first type



memory cells and an access to said second type memory cells.

4,799,197

SEMICONDUCTOR MEMORY DEVICE HAVING A CMOS SENSE AMPLIFIER

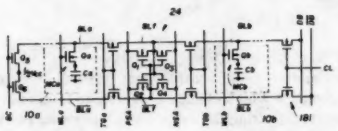
Yukinori Kodama, Yokohama; Hirohiko Mochizuki, Kawasaki; Masao Nakano, Kasugai; Tsuyoshi Ohira, Kawasaki, and Hidenori Nomura, Yokohama, all of Japan, assignors to Fujitsu Limited, Kanagawa and Fujitsu VLSI Limited, Aichi, both of, Japan

Filed Sep. 1, 1987, Ser. No. 91,795

Claims priority, application Japan, Sep. 2, 1986, 61-206439

Int. Cl.[4] G11C *7/00, 11/24*

U.S. Cl. 365—205 **6 Claims**



1. A semiconductor memory device comprising:

a memory cell array comprising memory cells;

a plurality of pairs of bit lines which are coupled to the memory cells and a data bus, each bit line being divided into at least two pairs of bit line parts;

at least one sense amplifier provided between said pairs of bit line parts in each of said pairs of bit lines, for sensing a difference in potential between bit line pairs in each pair, said sense amplifier being formed with complementary metal oxide semiconductor transistors; and

at least one pair of transfer gates provided between a non-data bus side and a data bus side of said sense amplifier;

wherein when a memory cell is selected, the transfer gate positioned on the side opposite to the selected memory cell is turned off in a state where the other transfer gate positioned on the same side as the selected memory cell is held in the on-state so that the difference in potential occurs between the pair of bit line parts on the same side as the selected memory cell, and thereafter the transfer gate positioned on the same side as the selected memory cell is turned off and the sense amplifier is activated, and wherein after the sense amplifier latches the difference in potential due to a datum stored in said selected memory cell, the transfer gate on the data bus side is turned on in a state where the transfer gate on the non-data bus side is held in the off-state, and thereafter the transfer gate on the non-data bus side is turned on.

4,799,198

IMAGE MEMORY

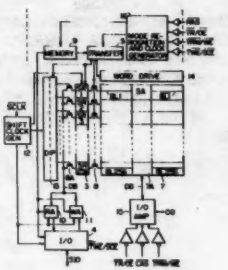
Junji Ogawa, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 11, 1986, Ser. No. 850,790

Claims priority, application Japan, Apr. 13, 1985, 60-77545

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—221 **10 Claims**



1. A video random access memory (Video RAM) having a plurality of RAM and shift register sets, said RAM being randomly accessed and said shift register being serially accessed, each RAM and shift register being connected by transfer gates in order to transfer read/write data, said Video RAM comprising: an input/output circuit operatively connected to said shift register and switched from an input side to an output side or from an output side to an input side in response to a direction of data transfer between said RAM and said shift register, and a transfer control means for controlling said switching of said input/output circuit and for controlling said direction of data transfer based on predetermined modes of input signals.

4,799,199

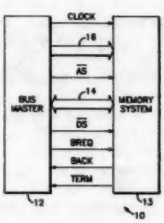
BUS MASTER HAVING BURST TRANSFER MODE

Hunter L. Scales, III, Austin; William C. Moyer, Dripping Springs, both of Tex., and William D. Wilson, Redwood City, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 18, 1986, Ser. No. 908,766

Int. Cl.[4] G11C *8/00, 11/40*

U.S. Cl. 365—230 **8 Claims**



1. A bus master for use with a memory capable of transferring operands in bursts of m in response to a burst request signal provided by the bus master, the operands being clustered modulo m about a selected access address provided by the bus master, where m is two (2) to the n power, n being an integer, the bus master comprising:

address register means for selectively storing the selected access address, and for incrementing modulo m a predetermined set of n bits of the selected access address in response to an increment signal; and

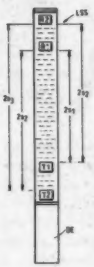
controller means for initially providing the burst request signal to the memory in response to a burst start signal, and, for m times thereafter, providing the burst request signal to the memory and the increment signal to the address register means in response to concurrently receiving from the memory both a burst acknowledge signal and a termination signal.

4,799,200

METHOD OF ACOUSTICALLY DETECTING FRACTURES IN A BOREHOLE

Philip S. Cheung, New Fairfield, Conn., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 21, 1985, Ser. No. 789,533
Int. Cl.[4] G01V *1/24*
U.S. Cl. 367—30 **6 Claims**



1. A method of detecting fractures in earth formations penetrated by a borehole, the method comprising the steps of:

(a) moving a tool through the borehole, the tool possessing transducers for transmitting and for receiving acoustic energy with at least one given transmitter-to-receiver spacing;

(b) repetitively causing the tool to transmit acoustic energy as it is moved, and recording the acoustic energy received in the form of echo waveforms by a transducer together with the corresponding transmitter-to receiver spacing, these echoes resulting from acoustic coupling between the transducers and the earth formations through the fluid filling the borehole;

(c) selecting a window in the recorded waveform containing compression wave echoes and extracting therefrom a compression amplitude magnitude An, thereby providing at least one compression amplitude curve as a function of depth An(z), associated with a transmitter-to-receiver half-spacing sn;

(d) isolating from the compression amplitude curve amplitude peaks having a width close to a predetermined value thereby obtaining at least one amplitude peak curve; and

(e) determining the presence of fractures from the curves Pn(z+sn) and from the curve Pn(z−sn); wherein

step (a) consists in lowering down the borehole a tool suitable for operating simultaneously at a plurality m of spacings, where an designates the half-spacing (with n=1 to m);

step (b) includes selective recording of the waveforms received at each transmission of acoustic energy and at each spacing;

steps (c), and (d) are selectively executed at each spacing to supply a set of compression amplitude curves An(z) and then a set of amplitude peak curves Pn(z) respectively associated with each of the half-spacings sn; and

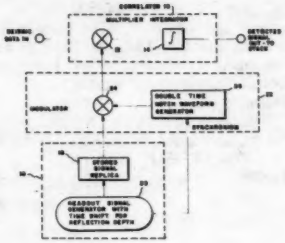
step (e) comprises determining two cross correlation coefficient curves T(z) and R(z) as a function of depth for the curves Pn(z+sn) and Pn(z−sn) respectively by determining the amplitude of the energy of the criss-cross patterns in relation to the amplitude or the energy of the direct echoes wherein the portions of the waveforms taken into account are those portions which are due to the compression waves, and which end at the first shear type wave or the first pseudo-Rayleigh type wave and wherein the processing relating to the criss-cross patterns includes summing the amplitudes taken from the waveforms and relating to the expected positions of the two arms of a criss-cross pattern within a window which covers the transmitter/receiver spacing in order in determine the total energy EX of the echoes on both arms of the criss-cross pattern, the presence of a fracture being determined on the basis of the difference between this total energy and zero.

4,799,201

METHODS AND APPARATUS FOR REDUCING CORRELATION SIDELOBE INTERFERENCE IN SEISMIC PROFILING SYSTEMS

David E. Nelson, Rochester, N.Y., assignor to Hydroacoustics, Inc., Henrietta, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,269
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—41 **28 Claims**



1. In a marine seismic exploration system using primary sweeps of signals which change in repetition frequency over a frequency range during the duration of said sweeps and which are received at hydrophones, the method of reducing interference in reflection signals received at said hydrophones from interfering sweeps which are received at said hydrophones upon reflection from the first break interface between the surface of an earth formation and the water covering said formation in overlapping time relationship with the primary sweep signals from reflecting interfaces in said formation below the surface thereof, which comprises determining intervals of time much shorter than the duration of said sweeps where said interfering signals and replicas of said primary sweeps received at said hydrophones correlate with each other, indicating points of stationary phase and correlating said primary signals received at said hydrophones with replicas thereof, one of which is reduced in amplitude at said intervals.

4,799,202

COMPLEMENTARY INTERFEROMETRIC HYDROPHONE

Gerald L. Assard, Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 423,941
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—149 **8 Claims**

1. A concentric complementary interferometric hydrophone comprising:

a rigid cylindrical tube;

a first elastomer applied on the outside of said tube;

a first optic fiber wound around said first elastomer;
a second elastomer applied on the inside of said tube;
a second optic fiber wound inside said second elastomer; and

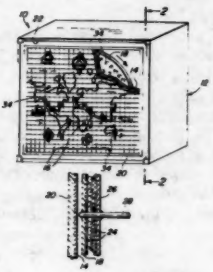
an axial aperture adapted to be free flooded located along the central axis of said second elastomer.

4,799,203

INTERNATIONAL WORLD CLOCK

Clifford Garland, 149 Van Brunt St., Brooklyn, N.Y. 11231

Filed Jun. 1, 1987, Ser. No. 58,505
Int. Cl.[4] G04B *19/22*
U.S. Cl. 368—27 **2 Claims**



1. An international world clock comprising a housing, a rectangular map panel secured in said housing, for indicating the major cities of the world, a rotatable removable circular time disk received in said housing, and a coupling means for said time disk secured to said time disk and a second disk, for driving said time disk behind said map panel and wherein said map panel is secured to a transparent pane secured in an opening in said housing, and a plurality of windows representing locations are provided through said top panel that align with time calibration imprinted on a face of said time disc, to provide the identical time comparison at all locations, and further comprising a pair of mating hook and loop pile fasteners, one of which is fixedly secured to a rear face of said time disk and another is similarly secured to a face of said second disk.

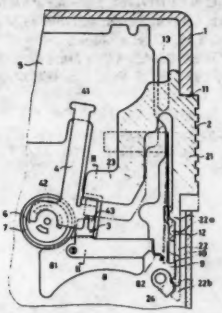
4,799,204

ALARM STOP DEVICE FOR A TIMEPIECE

Seiya Kitaoka, and Masao Hanya, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,284
Claims priority, application Japan, Apr. 27, 1987, 61-63794[U]
Int. Cl.[4] G04B *23/00*
U.S. Cl. 368—263 **1 Claim**

1. An alarm stop device of a timepiece comprising:
a slidable alarm stop lever;
an alarm stop switch actuatable by said alarm stop lever;
an engagement element provided on said alarm stop lever;
a control element which allows depression of such engagement element when said alarm stop switch is operative, and which inhibits depression of said engagement element when said alarm stop switch is not operative; and a snooze



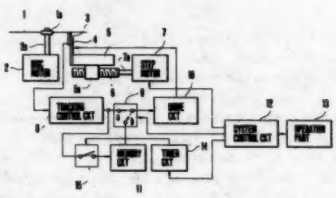
switch which can be opened and closed by depressing said alarm stop lever.

4,799,205

APPARATUS FOR CAUSING A HEAD TO ACCESS A SELECTED ONE OF A PLURALITY OF TRACKS

Masaya Maeda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 906,650, Sep. 11, 1986, abandoned, which is a continuation of Ser. No. 554,839, Nov. 23, 1983, abandoned. This application Jun. 2, 1987, Ser. No. 58,600
Claims priority, application Japan, Nov. 25, 1982, 57-206361
Int. Cl.[4] G11B *21/10*
U.S. Cl. 369—43 **39 Claims**



1. In a reproducing apparatus for reproducing recorded signals from a signal bearing medium, said medium having a plurality of tracks, each being recorded with a signal, wherein said apparatus includes selecting means for selecting any one of the plurality of tracks for reproduction, and

(A) transducer means for reproducing a signal from selected one of the tracks of said signal bearing medium;
(B) moving means for relatively moving said transducer means and said bearing medium so as to position the transducer means relative to said selected one of the tracks of the medium;
(C) adjusting means for adjusting the position of said transducer means relative to said selected track;
(D) control signal producing means for producing, on the basis of a reproduced signal obtained through said transducer means, a control signal for controlling said adjusting means so as to align the transducer means with said selected track;

wherein the improvement comprises

(E) memory means for memorizing said control signal produced from said control signal producing means; and
(F) signal providing means for providing said adjusting means with the control signal memorized in said memory means.

4,799,206

TRACKING CONTROL APPARATUS FOR RECORDING DISC REPRODUCING APPARATUS

Ryoichi Imanaka, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

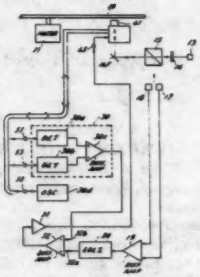
PCT No. PCT/JP84/00065, § 371 Date Oct. 22, 1984, § 102(e) Date Oct. 22, 1984, PCT Pub. No. WO84/03387, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 22, 1984, Ser. No. 667,485

Claims priority, application Japan, Feb. 22, 1983, 58-27912

Int. Cl.[4] G11B 7/08, 21/10

U.S. Cl. 369—44 18 Claims



1. A tracking control apparatus for a disc recording and/or reproducing apparatus, comprising:

(a) pickup means for reading information from tracks of a disc by using a light beam, said pickup means having a movable portion arranged to be displaced relative to said pickup means for effecting tracking control;

(b) tracking error detecting means associated with said pickup means for producing a tracking error signal indicative of a difference between a position of a track to be scanned and a scanning position of said light beam determined by a position of said movable portion;

(c) displacement detecting means for producing a displacement signal indicative of a displacement of said movable portion of said pickup means relative to said pickup means;

(d) signal processing means responsive to said tracking error signal and to said displacement signal from said displacement detecting means for producing a control signal, said signal processing means including first means for processing said tracking error signal, second means for processing said displacement signal to provide quicker response to and compensation for displacement of said movable portion than provided by said first means, and a circuit for combining said processed displacement signal with said processed tracking error signal for producing said control signal;

(e) said first means operable to prevent malfunctioning of said apparatus caused by defects of the disc surface and including means for limiting bandwith of said tracking signal for preventing malfunctioning caused by defects of the disc surface; and

(f) actuating means responsive to said control signal for effecting said tracking control by moving said movable portion.

4,799,207

APPARATUS AND METHOD FOR MAINTAINING PROGRESSION OF RECOVERY OF RECORDED INFORMATION

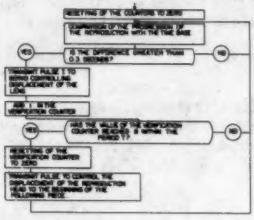
Stephane D'Alayer de Costemor d'Arc, Brussels, Belgium, assignor to Staar, S.A., Belgium

Filed Aug. 6, 1986, Ser. No. 893,862

Claims priority, application Belgium, Aug. 14, 1985, 215475

Int. Cl.[4] G11B 27/36

U.S. Cl. 369—58 8 Claims



8. A method of monitoring and correcting the relative movement of a reproduction element and a carrier having information recorded along a track on the carrier, the information including primary information and real time information quantitatively and cumulatively representing progression of instantaneous positions of the primary information in real time from a starting point, said method comprising the steps of:

providing a time-based reference value;

automatically and continuously monitoring the rhythm of the progression of the real time information recovered from the track by the reproduction element by comparing each time interval between successive instantaneous positions with the reference value;

delivering a control signal when a difference of predetermined value indicates a break in the rhythm of the recovered real time information based upon the comparison; and

making a first adjustment in the relative movement between the carrier and the reproduction element so that the reproduction element follows the track beyond the break to restore the rhythm of the progression of the recovered real time information.

4,799,208

OPTICAL RECORDING AND REPRODUCING APPARATUS HAVING ERASING FUNCTION WITH CONTROLLABLE ERASING BEAM INTENSITY

Isao Satoh, Neyagawa; Makoto Ichinose, Sakai; Yoshihisa Fukushima, Osaka; Yuzuru Kuroki, Toyonaka, and Yuuji Takagi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 3, 1986, Ser. No. 915,576

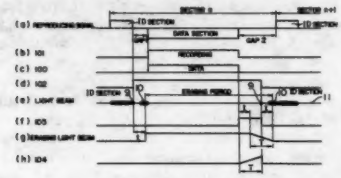
Claims priority, application Japan, Oct. 8, 1985, 60-224548; Oct. 8, 1985, 60-224548

Int. Cl.[4] G11B 7/125

U.S. Cl. 369—100 9 Claims

1. A data recording and reproducing apparatus comprising means for radiating an erasing light beam and a recording-reproducing light beam sequentially on an optical disc to record and reproduce and erase data, means for recording and reproducing data with said recording-reproducing light beam, means for erasing data with said erasing light beam, said erasing means radiating a data recording section of said disc with said erasing light beam, and means responsive to the termina-

tion of a recording interval for reducing the average intensity of said erasing light beam during a period of time following



said recording interval termination after which period said erasing light beam is turned off.

4,799,209

CLAMPING DEVICE FOR CLAMPING AN OPTICAL DISC ONTO A DRIVE SPINDLE

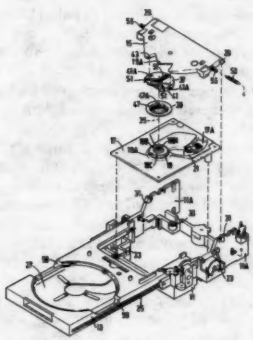
Henri M. Grobben, Hasselt, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 23, 1987, Ser. No. 76,824

Claims priority, application Netherlands, Jul. 28, 1986, 8601938

Int. Cl.[4] G11B *17/04, 25/04*

U.S. Cl. 369—75.2 **7 Claims**



4. A disc record player for playing a disc having a center hole, the player comprising

a housing having a front opening therein,

a first frame fixed in said housing and provided with guide means,

a drawer which is movable through said front opening along said guide means, between a slid-out and a slid-in position for bringing the disc into a playing position,

a second frame resiliently mounted to the first frame,

a turntable mounted in said second frame, said turntable being rotatable about an axis of rotation and having a centering member for reception in said hole,

a pressure element movably connected to said first frame, said pressure element being movable between a first position and a second position,

a holder carried by said pressure element, said holder comprising at least three resilient limbs, each limb having a fixed end and a free end, said free ends being collectively configured to journal a spindle for radial movement, and

a pressure member having a central spindle journaled between said free ends of said resilient limbs and a centering wall configured to cooperate with said centering member, said pressure member being spaced from the turntable in the first position and cooperating with the turntable in the second position.

4,799,210

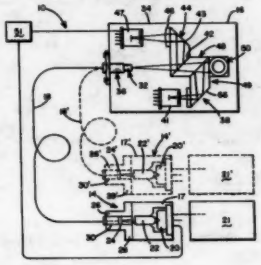
FIBER OPTIC READ/WRITE HEAD FOR AN OPTICAL DISK MEMORY SYSTEM

Mark L. Wilson, Vadnais Heights, and Bernard S. Fritz, Eagan, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 5, 1986, Ser. No. 927,213

Int. Cl.[4] G11B *7/12*

U.S. Cl. 369—110 **10 Claims**



1. An optical storage system comprising a storage means, light source means for directing a light beam onto said storage means comprising laser means for producing a directed laser beam, first and second beam-splitting means, first and second monitoring means, optical conduit means coupled to said laser means for receiving and supplying said directed laser beam onto said first beam-splitting means which in turn directs a major portion of said directed laser beam onto said storage means, which produces a reflected directed beam from said storage means and a reflected portion of said reflected directed laser beam from said storage means onto said first monitoring means for monitoring said reflected directed laser beam and power control means coupled to said second monitoring means and said laser means wherein said second beam-splitting means directs a minor portion of said directed laser beam onto said second monitoring means before said directed laser beam is directed onto said storage means and said power control means adjusts to power of said laser means to control the power of said directed laser beam.

4,799,211

APPARATUS AND METHOD FOR STORING PERFORMANCE PARAMETERS OF LOCAL AREA NETWORK SYSTEM MEMBERS

Michael Felker, Rio Rancho, and Angelo Viverito, Albuquerque, both of N. Mex., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 23, 1987, Ser. No. 76,724

Int. Cl.[4] H01J *1/16*

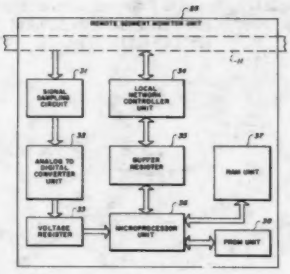
U.S. Cl. 370—17 **20 Claims**

1. Apparatus for monitoring parameters of local area network system members, said monitoring apparatus coupled to a segment cable coupling said local area network members, wherein said local area network members apply transaction signal groups to said segment cable, said monitoring apparaus comprising:

sampling means for determining a value related to a magnitude of each transaction signal group on said segment cable;

decoding means for decoding selected portions of said transaction signal group, a one of said selected portions identi-

fying a network system member originating said transaction; and



storage means for storing said each transaction signal group magnitude in association with an originating system member identification.

4,799,212

CIRCUIT FOR CONTROLLING TWO SIGNALS APPROXIMATELY 90 DEGREE APART IN PHASE

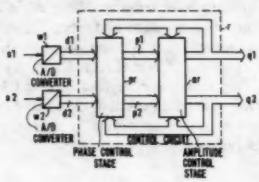
Soenke Mehrgardt, March, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 22,833

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 86103522

Int. Cl.[4] H04J *11/00*

U.S. Cl. 370—20 **35 Claims**



1. A circuit for controlling first and second quadrature analog signals approximately 90° apart in phase so as to obtain two signal waveforms having a phase difference of exactly 90° and exactly equal amplitudes, said circuit comprising:

first and second analog-to-digital converters responsively coupled to receive said first and second quadrature analog signals, respectively, said first and second analog-to-digital converters providing respective first and second digital signals as outputs;

a digital control circuit responsively coupled to said first and second analog-to-digital converters, said digital control circuit receiving said first and second digital signals and generating first and second quadrature digital signals, said digital control circuit comprising:

a phase control stage that provides first and second phase-corrected digital signals, said phase control stage comprising:

a first multiplier having first and second inputs and an output, said first and second inputs connected to receive said first and second quadrature digital signals, respectively;

a low-pass filter having an input and an output, said input connected to said output of said first multiplier, said output of said low-pass filter being a phase control value;

a second multiplier having first and second inputs and an output, said first input connected to said output of said low-pass filter, said second input receiving one of said first and second digital signals, said one of said first and second digital signals also provided as the corresponding one of said first and second phase-corrected digital signal outputs of said phase control stage; and

an arithmetic unit having first and second inputs and an output, said first input connected to said output of said second multiplier, said second input connected to the other of said first and second digital signals, said output of said arithmetic unit provided as the corresponding other of said first and second phase-corrected digital signal outputs of said phase control stage; and

an amplitude control stage that adjusts the amplitudes of respective frequency components of said first and second quadrature digital signals to be substantially identical, said amplitude control stage receiving said first and second phase-corrected digital signals from said phase control stage and providing said first and second quadrature digital signals as outputs, said amplitude control stage comprising:

an amplitude comparator having a minuend input, a subtrahend input and an output, said minuend input of said amplitude comparator connected to one of said first and second phase-corrected digital signals, said one of said first and second phase-corrected digital signals further being provided as one of said first and second quadrature digital signals, said one of said first and second quadrature digital signals corresponding to said one of said first and second phase-corrected digital signals;

an averaging device having an input and an output, said input connected to said output of said amplitude comparator; and

a signal amplifier, said signal amplifier being a third multiplier having first and second inputs and an output, said first input connected to said output of said averaging device, said second input connected to the other of said first and second phase-corrected digital signals, said output of said third multiplier connector to said subtrahend input of said amplitude comparator, said output of said third multiplier further being provided as the quadrature digital signal output of said amplitude control circuit and said digital control circuit corresponding to said other.

4,799,213

DATA TRANSMISSION SYSTEM

John Fitzgerald, Gwent, Wales, assignor to Standard Telephones & Cables, London, England

Filed Sep. 7, 1984, Ser. No. 648,127

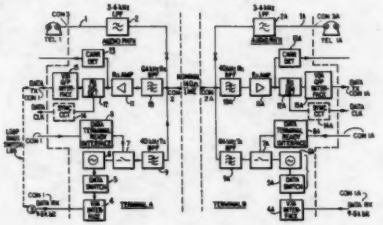
Claims priority, application United Kingdom, Sep. 10, 1983, 8324310

Int. Cl.[4] H04J *1/02*

U.S. Cl. 370—30 **3 Claims**

1. A transmission system in which data and voice signals can be transmission system in which data and voice signals can be transmitted independently yet simultaneously over a telephone line, the system comprising co-operating first and second terminals, each terminal having connections connectible to a respective data terminal unit, the telephone line, so that a data unit is connected to the telephone line via the associated terminal and to a respective telephone, the first terminal having means for generating a first carrier signal above voice frequency, the second terminal having means for generating a second carrier signal above voice frequency, the first and second carrier signal frequencies being substantially separated from each other and being permanently assigned to respective terminals, each of said terminals further comprising: first and second bandpass filters used for selecting respectively said first and second carrier signals in respective transmit and receive

circuits of the terminal, the receive passband of the first terminal and the transmit passband of the second terminal being centered on said second carrier frequency and the transmit passband of the first terminal and the receive passband of the second terminal being centered on said first carrier frequency; said transmit circuit including a modulator for modulating the respective carrier signal with data for transmission from the transmit circuit to the line via said connections; said receive circuit including a demodulator coupled to said second filter and used for recovering data from the respective carrier signal received from the line via said connections, and an amplifier used for amplifying the recovered data; a low pass filter coupled to said connections to receive both voice and carrier signals from the telephone line and having a passband effective



to pass only voice signals and thus isolate the voice and data signals and having a loss frequency characteristic effective to minimize the effects of low frequency interference signals affecting the data transmission, and wherein one of said terminals has a manually operable loopback switch connected to the connections connectible to the data terminal unit and having a first state in which normal transmission and reception takes place between the associated data terminal unit and the telephone line via said one terminal, and a second state in which data from the telephone line is looped back to the telephone line via said connections connectible to the telephone line and data from the associated data terminal unit is looped back to the data terminal unit via the connections connectible to the data terminal unit to facilitate a test procedure to test the system.

4,799,214

TWO-WIRE FULL DUPLEX FREQUENCY DIVISION MULTIPLEX MODEM SYSTEM HAVING ECHO CANCELLATION MEANS

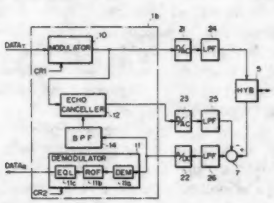
Takashi Kaku, Tama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 22, 1986, Ser. No. 944,508

Claims priority, application Japan, Dec. 23, 1985, 60-289966

Int. Cl.[4] H04B *9/00*

U.S. Cl. 370—32.1 **8 Claims**



1. A frequency division multiplex modem system, comprising:

first modem means for modulating first data to produce a first modulated signal having a first frequency band and for demodulating a second modulated signal having a second frequency band, said first and second frequency bands being adjacent and non-overlapping;

transmission line means, having a two-wire duplex line structure, for transmitting said fist and second modulated signals therethrough; and

second modem means for modulating second data to produce the second modulated signal, having said second frequency band and received by said first modem means, and demodulating said first modulated signal from said first modem means;

said first and second modem means each comprising:

modulating means for modulating transmission data to produce a modulated transmission signal using digital signal processing,

synthesizer means, operatively connected to said modulating means and said transmission line means, for synthesizing said modulating transmission signal and a modulating reception signal containing an echoed transmission signal using analog processing and for outputting said modulated transmission and reception signals to said transmission line means,

subtracter means, operatively connected to said synthesizer means, for subtracting a combined echo cancellation signal from said modulated reception signal to produce a result signal using analog processing,

demodulating means, operatively connected to said subtracter means, for demodulating said result signal to produce received data using digital signal processing,

echo canceller means, operatively connected to said modulating means and said subtracter means for receiving said modulated transmission and result signals therefrom and for using digital processing to generate said combined echo cancellation signal, supplied to said subtracter means, in dependence upon said modulated transmission signal and said result signal from said subtracter means, said combined echo cancellation signal including a first echo cancellation signal for cancelling said modulated transmission signal as output from said synthesizer means and a second echo signal for cancelling said echoed transmission signal in said modulated reception signal,

a digital-to-analog converter, operatively connected between said modulating means and said synthesizer means, for converting said modulated transmission signal from digital form to an analog signal, and

an analog-to-digital converter, operatively connected to said subtracter means, said demodulating means and said echo canceller means, for converting said result signal from said subtracter means to a digital signal.

4,799,215

HIGH-SPEED PACKET-SWITCHED COMMUNICATIONS SYSTEM WITH END-TO-END FLOW CONTROL AND RETRANSMISSION

Hiroshi Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 7, 1986, Ser. No. 916,429

Claims priority, application Japan, Oct. 7, 1985, 60-224430; Oct. 11, 1985, 60-226249; Oct. 11, 1985, 60-226250

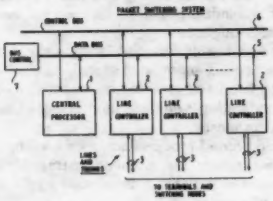
Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **15 Claims**

1. A packet switched communications system comprising a plurality of terminals, a plurality of switching nodes for serving said terminals and a plurality of transmission links interconnecting said terminals and said switching nodes, each of said terminals being capable of returning an acknowledgement to a source terminal when a packet is correctly received therefrom, transmitting a series of packets without receiving said acknowledgement and retransmitting to a destination terminal a packet which has not been correctly received,

wherein each of said terminals includes means for effecting a determination of whether or not a packet to be exchanged

between source and destination terminals is required to be retransmitted and effecting an omission of the retransmission of a packet which has not been correctly received when said packet is determined as not being required to be retransmitted.



4,799,216

DISTRIBUTED SWITCHING SYSTEM

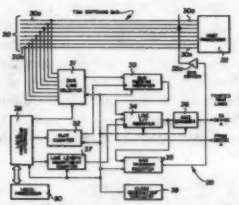
Charles B. Johnson, Dallas; Jeffrey L. Box, Farmers Branch, and David B. Hildebrand, Bedford, all of Tex., assignors to SRX Corporation, Dallas, Tex.

Continuation of Ser. No. 706,320, Feb. 27, 1985, Pat. No. 4,685,104. This application May 4, 1987, Ser. No. 46,233

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] H04Q *11/04*; H04J *3/02*

U.S. Cl. 370—67 **19 Claims**



1. In a communication system for the communication of voice and data having a local processor, a host processor, data devices having line interfaces and a distributed switching system interconnecting the processors and data devices, an improved switching bus providing for communication between the processors and communication between the data devices comprising:

a plurality of bus lines being time division multiplexed serial data streams and having time slots used for both transmit and receive directions and being connected to the host processor and the distributed switching system;

each of said bus lines having time slots which may be used for processor communication and time slots which may be used for transparent switching of voice and data; and

said plurality of bus lines comprising a single bidirectional bus used for both communication between the local processor and the host processor and for transparent switching of voice and data.

4,799,217

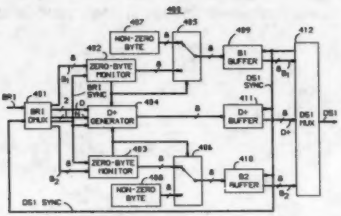
THREE TIME SLOT DIGITAL SUBSCRIBER LINE TERMINATION

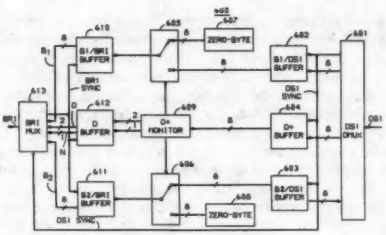
Rong-Chin Fang, North Andover, Mass., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 20, 1986, Ser. No. 898,697

Int. Cl.[4] H04Q *11/04*; H04J *3/06*

U.S. Cl. 370—68.1 **29 Claims**





1. Apparatus for interfacing a digital subscriber line of the type having a digital transmission format including at least one communication channel, comprising:

means for interrogating logical signals in bit positions of said at least one communication channel, said interrogating means generates an output signal indicating whether or not a predetermined bit pattern is present in said at least one communication channel having a first predetermined logical signal in all bit positions,

means responsive to said output signal from said interrogating means for controllably replacing said predetermined bit pattern in said at least one communication channel with a prescribed bit pattern having a logical signal other than said first predetermined logical signal in at least one bit position when said output signal indicates that said predetermined bit pattern is present and for yielding an at least one output communication channel,

means for generating a control channel having a plurality of bit positions, said means for generating being responsive to said output signal from said interrogating means for inserting a second predetermined logical signal into a first predetermined bit position of said control channel to indicate whether or not said predetermined bit pattern was replaced, and

means for combining said at least one output communication channel and said control channel for transmission over a digital transmission facility.

4,799,218

NETWORK SYSTEM

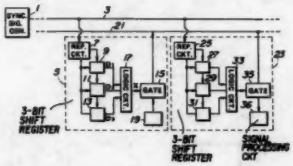
Atsushi Sakagami, Yokosuka; Toru Futami, Yokohama; Noriyuki Abe, Yokosuka, and Tadashi Suzuki, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 5, 1986, Ser. No. 836,623

Claims priority, application Japan, Mar. 28, 1985, 60-62099; May 17, 1985, 60-103942

Int. Cl.[4] H04J 3/02

U.S. Cl. 370—85 14 Claims



1. A network system, comprising:

(a) first means for generating and transmitting a periodic predetermined time series code string signal in synchronization with a synchronization signal generated thereby having a predetermined period;

(b) second means for receiving said periodic predetermined time series code string signal from said first means via an address clock line and for detecting whether one of a plurality of code patterns derived from the received predetermined time series code string signal coincides with a predetermined code pattern indicating an address of one data station and outputting a first signal indicating that said code pattern accords with said predetermined code pattern; and

(c) third means for carrying out at least one of transmission and reception of data constituted by a plurality of serial bits for a period of time determined by said number of bits constituting the data via a data transmission line to which others of said third means are connected, each bit of the data on the data transmission line being continuously transmitted until the end of the data transmission, a period of each bit being equal to the predetermined period in synchronization with the synchronization signal derived from said first means when said second means outputs said first signal.

4,799,219

PSEUDO SYNCHRONOUS TRANSPORT MECHANISM IN A COMMUNICATION NETWORK

Jean Calvignac, LaGaude, and Pierre Secondo, St Jeannet, both of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 24, 1987, Ser. No. 77,484

Claims priority, application European Pat. Off., Aug. 27, 1986, 86430029.8

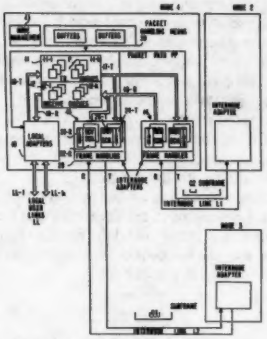
Int. Cl.[4] H04J 3/26

U.S. Cl. 370—94 8 Claims

1. Pseudo synchronous transportation apparatus to be used in a communication network comprising a plurality of nodes for exchanging non-character coded information NCI and character coded information on internode links in frames comprising circuit slots devoted to the transporation of non-character coded information, which slots are assigned to circuit users on the call basis under control of node management means (13), said slots being qualified by at least one qualification bit (Caq) which indicates when set to a first value (0) that the users are momentarily active and when set to a second value (1) that the users are momentarily inactive, said mechanism being characterized in that it comprises, in the nodes which may be connected to local users:

storing means (11, 12) comprising queues of storing positions assigned on the call basis to the circuit users which send and receive information in the slots of the frames transported on the links connected to the node, the circuit user information received from the node links being stored into the assigned queue;

internode adapting means (14, 15) which controls the generation and the reception of the frames to and from each internode link operating under the control of the node management means and which assigns on the call basis a set of at least one slot in the frames transported on the network link to a plurality of circuit users and which comprises for each of said links, transmit and receive control means (24-T, 26-T, 20-R, 22-R, 28),



said transmit control means comprising queue addressing means causing the queues of storing portions assigned to the said plurality of circuit users to be sequentially scanned and read and the read information corresponding to momentarily active users to be sent on the link during the assigned slots of successive frames together with a qualification bit set to a first value,

said receive control means comprising queue addressing means causing the information received in the slots assigned to the said plurality of users in successive frames to be written into the queues of storing positions assigned to said users, which are sequentially scanned, when the qualification bits are found equal to the first value.

4,799,220

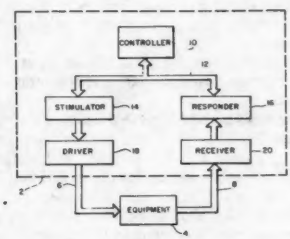
DYNAMIC SYSTEM FOR TESTING AN EQUIPMENT

Robert E. Nielsen, Farmingville, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 19, 1987, Ser. No. 16,685

Int. Cl.[4] G06F 11/06

U.S. Cl. 371—25 11 Claims



1. In an instrument for testing the operational status of an

equipment under test, an apparatus for stimulating the equipment and for receiving responses therefrom, the apparatus being connected to a controller for receiving instructions therefrom, the apparatus comprising:

stimulating means electrically connected to the controller for accepting therefrom instructions representative of stimulus signals;

means connected to the stimulating means and the equipment for fetching the stimulus signals and for providing the stimulus signals to the equipment, respectively;

means connected to the equipment for receiving from the equipment signals generated thereby in response to the stimulus signals;

means connected to the receiving means for comparing in real time the response signals inputted thereto from the receiving means with expected signals fed thereto from an expected memory means; wherein, if a response signal differs from an expected signal, the comparing means sends out an error signal for instantaneously indicating an improper operation by the equipment; and

means connected to the comparing means for storing data resulting from the real time comparison between the response signals and the expected signals, the storing means communicating with the controller;

wherein, upon completion of the providing of the stimulus signals to the equipment, the controller can recall from the storing means a particular data representing the operational status of the equipment for a corresponding stimulus and expected signal comparison.

4,799,221

APPARATUS FOR REPRODUCING A DIGITAL SIGNAL

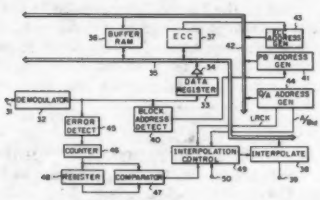
Tadashi Fukami; Shinya Ozaki, both of Kanagawa, and Kentaro Odaka, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 3, 1987, Ser. No. 21,226

Claims priority, application Japan, Mar. 4, 1986, 61-46958; Mar. 7, 1986, 61-49744

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—38 **7 Claims**



1. An apparatus for reproducing a digital signal in which continous blocks of input data are supplied to said apparatus and each of said blocks consists of a PCM signal which was error correction coded and additional codes which were subjected to an error correction or detection coding process, said apparatus comprising:

means for error correcting each of said input data blocks using the error correction code and outputting error corrected data;

decoding means for decoding the additional codes using the error detection code or the error correction code;

interpolating means, which is supplied with output data of said error correcting means, for interpolation with respect to error corrected PCM data whose errors cannot be corrected and also with respect to error corrected PCM data designated by a pointer; and

deciding means, which operates independently of the result of the correction by said error correcting means, for setting an error pointer to the error corrected PCM data which is supplied to said interpolating circuit in accordance wit the decoding state of said coding means.

4,799,222

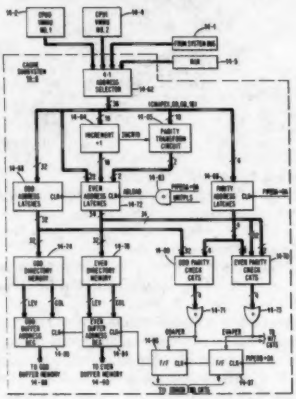
ADDRESS TRANSFORM METHOD AND APPARATUS FOR TRANSFERRING ADDRESSES

George J. Barlow, Tewksbury, Mass.; James W. Keeley, Nashua, N.H., and Chester M. Nibby, Jr., Beverly, Mass., assignors to Honeywell Bull Inc., Waltham, Mass.

Filed Jan. 7, 1987, Ser. No. 1,124

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—51 **20 Claims**



1. A method of enabling the subsequent verification of the integrity of a transfer of an address received from any one of a number of sources through an address path including an incrementing circuit, said address including a number of integrity bits and said method comprising the steps of:

(a) separating said number of integrity bits from said address received from any one of said number of sources;

(b) storing said number of integrity bits;

(c) generating a number of transform bits as a function of whether or not said received address is being incremented by said increment circuit as said address is being passed through said incrementing circuit;

(d) storing said number of transform bits;

(e) complementing said integrity bits according to the states of said stored number of transform bits of step (d) to produce transformed integrity bits; and

(f) transferring said incremented address generated by said incrementing circuit together with said transformed integrity bits produced by step (e) to a utilization device for said subsequent verification.

4,799,223

SPLIT CONTACT PHASED ARRAY LASERS

William Streifer, Palo Alto, Calif.; Robert D. Burnham, Wheaton, Ill., and Thomas L. Paoli, Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 6, 1987, Ser. No. 82,774

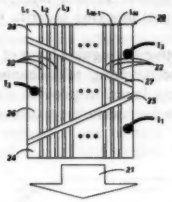
Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—24 **2 Claims**

1. In a split contact phased array laser comprising a plurality of parallel emitters under phase locked operation and productive of an output beam having a preferred emission wavelength and preferred far field mode of operation,

means to pump said laser and change the charge distribution profile therein to cause said output beam to deflect and scan in the far field,

the improvement wherein said laser is divided into at least three independently current pumped segments transversely of said emitters, and wherein at least one of said segments is current pumped above threshold level sufficient to primarily determine said emission wavelength and mode of operation of said laser while the current supplied



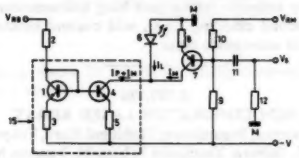
to the other of said segments is below said level and is varied relative to one another to cause said output beam to deflect and scan in the far field without substantial change to said emission wavelength and mode of operation established relative to said one segment to thereby provide effective control of the overall active region charge density.

4,799,224

DRIVER FOR A SEMICONDUCTOR LASER

Stefano Bottacchi, Milan, and Mauro Oselladore, Trieste, both of Italy, assignors to GTE Telecomunicazioni, S.p.A., Cassina de Pecchi, Italy

Filed Nov. 6, 1986, Ser. No. 927,621
Claims priority, application Italy, Dec. 10, 1985, 23160 A/85
Int. Cl.⁴ H01S *3/00, 3/13*
U.S. Cl. 372—38 **12 Claims**



1. A driver circuit for a semiconductor laser comprising:
a bias current source, coupled in series with said semiconductor laser forming a junction therebetween; and
a modulating current source including a single transistor having a main conduction path coupled between said junction and a source of reference potential, said transistor further including a control electrode responsive to a modulating signal.

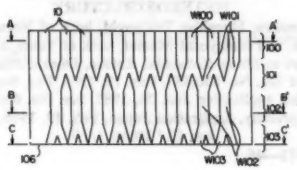
4,799,225

SEMICONDUCTOR LASER ARRAY DEVICE

Mototaka Taneya, Sakura; Sadayoshi Matsui, and Mitsuhiro Matsumoto, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 5, 1987, Ser. No. 104,865
Claims priority, application Japan, Oct. 7, 1986, 61-238240
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—44 **2 Claims**

1. A semiconductor laser array device with a waveguide structure comprising:
a first array portion which is composed of a plurality of waveguides in a parallel adjacent manner with an optical phase-coupling between the adjacent waveguides with a predetermined pitch,
a second array portion which is composed of a plurality of waveguides in a parallel manner with an optical phase-coupling between the adjacent waveguides at the position displaced half way between the position of each of the waveguides of the first array portion,
a third array portion which is composed of a plurality of symmetrically branching waveguides that optically connect the ends of the parallel waveguides of the first array portion with the ends of the parallel waveguides of the second array portion, and



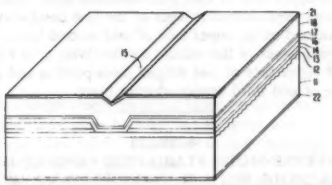
a fourth array portion which is composed of a plurality of symmetrically branching waveguides that are optically connected to the other ends of the parallel waveguides of the second array portion, the ends of said symmetrically branching waveguides of the fourth array portion meeting one laser-emitting face of said laser array device at which said symmetrically branching waveguides begin to be optically combined with the adjacent symmetrically branching waveguides, wherein the waveguide structure produces a near-field pattern at said light-emitting face with said near-field pattern having an optical intensity distribution exhibiting minimized ripple.

4,799,226

DISTRIBUTED FEEDBACK LASER DIODE COMPRISING AN ACTIVE LAYER PARTLY ADJACENT TO A WAVEGUIDE LAYER

Ikuo Mito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 1, 1987, Ser. No. 56,011
Claims priority, application Japan, May 30, 1986, 61-125467
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—45 **5 Claims**



1. In a semiconductor laser comprising a semiconductor substrate having a first conductivity type and a corrugated surface, an optical waveguide layer having said first conductivity type and a greater refractive index than said substrate, a first stack which comprises a current confining layer having a second conductivity type and a smaller refractive index than said waveguide layer and a current blocking layer of said first conductivity type and which has a pair of inwardly directed surfaces defining a groove therein and dividing said blocking layer and said confining layer into two current blocking parts and two current confining parts, respectively with an area of said waveguide layer exposed as a groove bottom, and a sec-

ond stack which consecutively comprises a first cladding layer having said first conductivity type and a smaller refractive index than said waveguide layer, an active layer having a greater refractive index than said waveguide layer, and a second cladding layer having said second conductivity type and a smaller refractive index than said waveguide layer, said waveguide layer being on said corrugated surface, said current confining layer being on said waveguide layer, said first cladding layer being on said current blocking parts, said inwardly directed surfaces, and said groove bottom.

4,799,227

SEMICONDUCTOR LASER DEVICE HAVING A BURIED HETEROSTRUCTURE

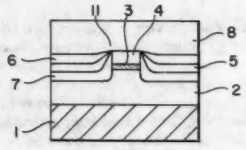
Shinji Kaneiwa; Haruhisa Takiguchi, both of Nara; Toshihiko Yoshida, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 830,857, Feb. 19, 1986, Pat. No. 4,692,206. This application Jun. 26, 1987, Ser. No. 66,510

Claims priority, application Japan, Feb. 19, 1985, 60-33601

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—46 **13 Claims**



1. A semiconductor laser device having a structure comprising:

a multi-layer crystal structure which includes a striped mesa-portion disposed on a substrate, said striped mesa portion having an active layer for laser oscillation;

a three-layer structure formed on said multi-layer crystal structure, said three-layer structure including

a first semiconductor layer of a first conductivity type formed over the entirety of an upper face of said multi-layer crystal structure except for an upper face of said striped mesa-portion, wherein said first semiconductor layer is formed at both sides of said striped mesa-portion so as to form a heterojunction at each side of said active layer,

a second semiconductor layer of a second conductivity type opposite to the first conductivity type formed on an upper face of said first semiconductor layer, and

a third semiconductor layer of the first conductivity type formed on an upper face of said second layer; and

a burying layer of the second conductivity type formed on said upper face of said striped mesa-portion and an upper face of said third semiconductor layer.

4,799,228

TRANSVERSE-MODE STABILIZED SEMICONDUCTOR LASER DIODE WITH SLAB-COUPLED WAVEGUIDE

Hiroko Nagasaka, Yokohama; Gen-ichi Hatakoshi, Yokohama; Naohiro Shimada, Yokahama; Motoyuki Yamamoto, Kawasaki; Masaki Okajima, Kunitachi; Yoshio Iizuka, Yokohama; Hatsumi Kawata, Tokyo; Hideaki Kinoshita, Yokohama, and Nobuyuki Matsuura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 21, 1986, Ser. No. 898,706

Claims priority, application Japan, Aug. 23, 1985, 60-185531; Aug. 23, 1985, 60-185532

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—46 **7 Claims**

1. A semiconductor laser diode, comprising:

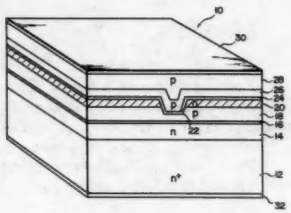
(a) a semiconductive substrate of a first conductivity type;

(b) first and second semiconductive cladding layers of first and second conductivity types, which are sequentially stacked on said substrate;

(c) an active layer of a semiconductor film sandwiched between said first and second cladding layers;

(d) a semiconductive current blocking layer of the first conductivity type formed on said second cladding layer, a channel groove being formed in said current blocking layer and said second cladding layer, to be deep enough to cause said current blocking layer to be divided into two parts;

(e) a semiconductive waveguide layer of the second conductivity type, for covering said channel groove and said current-blocking layer, to provide a slab-coupled waveguide structure for transverse mode oscillation;



(f) a semiconductive overcoating layer of the second conductivity type formed on said waveguide layer; and

(g) first and second conductive layers respectively formed on said substrate and said semiconductor overcoating layer to serve as electrodes of said laser diode;

wherein said second cladding layer, said current blocking layer, and said waveguide layer are formed of a compound semiconductor containing aluminum with said current blocking layer containing aluminum in an amount larger than that contained in said waveguide layer to thereby improve lattice matching characteristics among said second cladding layer, said current blocking layer, and said waveguide layer.

4,799,229

SEMICONDUCTOR LASER ARRAY

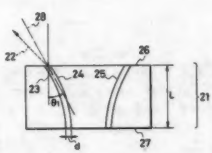
Seiichi Miyazawa, Sagamihara; Toshitami Hara, Tokyo; Hidetoshi Nojiri, Isehara; Yoshinobu Sekiguchi, Yamato; Mitsutoshi Hasegawa, Yokohama, and Sotomitsu Ikeda, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1987, Ser. No. 49,165

Claims priority, application Japan, May 15, 1986, 61-112202; May 19, 1986, 61-114003; May 19, 1986, 61-114009; May 19, 1986, 61-114010

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—50 **8 Claims**



1. A semiconductor laser array, comprising:

a single substrate; and

a plurality of semiconductor laser elements monolithically formed on said single substrate, wherein each of said semiconductor laser elements comprises:

a plurality of semiconductor layers comprising a laser active layer;

first and second end faces formed by said plurality of semiconductor layers and comprising a pair of resonance planes from which laser light is emitted; and

a plurality of electrodes for supplying current to said plurality of semiconductor layers,

wherein an angle formed between the direction in which light is emitted from said first end face of each of said laser elements and the direction in which light is emitted from said first end face of an arbitrary reference one of said laser elements is different from an angle formed between the direction in which light is emitted from said second end face of said each of said laser elements and the direction in which light is emitted from said second end face of said arbitrary reference one of said laser elements, and wherein at least one of said angles is a non-zero finite angle.

4,799,230

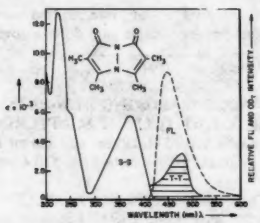
LASER DYES DERIVED FROM BIMANES

Theodore G. Pavlopoulos, San Diego, Calif., and Joseph H. Boyer, New Orleans, La., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

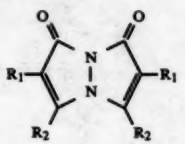
Filed Nov. 20, 1987, Ser. No. 125,646

Int. Cl.[4] H01S *3/20*

U.S. Cl. 372—53 **20 Claims**



1. A lasing media in which the lasing compound has the following structure:



wherein this compound is abbreviated as:

syn (R_1, R_2) bimane and R_1 and R_2 are chemical radicals.

4,799,231

LASER GAS ORIFICE INJECTION SYSTEM

Donald E. Smith, San Jose, Calif., and Michael W. Sasnett, Los Altos, Calif., assignors to Coherent General, Palo Alto, Calif.

Filed Sep. 24, 1987, Ser. No. 101,130

Int. Cl.[4] H01S *3/22*

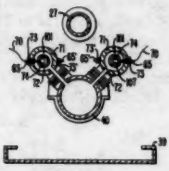
U.S. Cl. 372—58 **19 Claims**

1. A laser resonator system, including:

a laser resonator tube having a first longitudinal axis, said laser resonator tube also having a side wall including a first orifice through which gas flows into the tube;

a first elongated electrode, having a second longitudinal axis and a first end portion; and

means for mounting the first electrode at the first orifice so that the fist end portion is in electrical communication with gas flowing through the first orifice into the tube, and so that the projection of the first end portion on the



plane of the first orifice is spaced from the center of the first orifice.

4,799,232

GAS LASER AND METHOD

Wolfgang Welsch, Baldham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 78,185

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632502

Int. Cl.[4] H01S *3/03*

U.S. Cl. 372—61 **7 Claims**

1. A discharge vessel for a gas laser, comprising:

a vacuum-tight glass bulb having an outer wall;

a laser capillary rigidly connected to said discharge vessel at a first end of said glass bulb;

a first optical part secured to a first mount, said first mount including a bore extending coaxially with said laser capillary;

an end piece closing said glass bulb at one end, said end piece having a bore coaxially aligned with said laser capillary, said end piece being of sintered glass having a low sensitivity to temperature fluctuations and being connected to said glass bulb in vacuum-tight fashion;

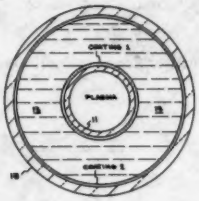
a second mount aligned with and positioned at an end of said capillary opposite to said first mount and bearing a second optical part; and

said first mount comprising a thin walled part connected to said end piece, said first optical part secured in said first mount being a mirror.

4,799,233
FLASHLAMP RADIATION RECYCLING FOR ENHANCED PUMPING EFFICIENCY AND REDUCED THERMAL LOAD

Kenneth S. Jancaitis, Pleasant Hill, and Howard T. Powell, Livermore, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 23, 1986, Ser. No. 922,424
Int. Cl.[4] H01S 3/092
U.S. Cl. 372—70 **3 Claims**



1. A method of decreasing the thermal load generated in the matrix of a solid state laser, when the matrix is irradiated by a flashlamp, wherein flashlamp radiation is produced within a pair of flashlamp envelopes, that are spaced apart from one another in a cylindrically concentric relationship, and that are each substantially transparent to the flashlamp radiation, with minimal loss in flashlamp pumping efficiency, where the laser may be pumped only for wavelengths λ less than an upper cut-off wavelength λ_{co}, the method comprising the steps of:

providing a first optical coating on either flashlamp envelope of the pair of flashlamp envelopes, that reflects a substantial portion of all radiation having wavelengths λ less than a first predetermined wavelength λ_c that lies in the range $0.35\ \mu m \leqq \lambda_c \leqq 0.7\ \mu m$; and

providing a second optical coating on the other flashlamp envelope of the pair of flashlamp envelopes, that reflects a substantial portion of all radiation with wavelengths greater than a second predetermined wavelength λ_d and transmits radiation having wavelengths satisfying $\lambda_c < \lambda < \lambda_d$, where $\lambda_d \approx \lambda_{co}$.

4,799,234
LASER TRANSMITTER INCLUDING AN EXTERNAL OPTICAL RESONATOR

Klaus M. Haeussler, Munich; Julius Wittmann, Oberhaching; Gisela Gaukel, Munich, and Franz Auracher, Baierbrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 14, 1987, Ser. No. 95,886
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1986, 3633077
Int. Cl.[4] H01S 3/082; G02B 6/22, 6/26
U.S. Cl. 372—97 **5 Claims**

1. A laser transmitter, comprising:

a semiconductor laser;

an external optical resonator in the form of a wavelength-selective fiber directional coupler, said wavelength selective fiber directional coupler being composed of a dispersive double core fiber,

a first core of said double core fiber being a first waveguide coupled to said semiconductor laser to receive radiant laser energy,

a second core of said double core fiber being a second waveguide having a defined coupling length relative to said first waveguide for coupling power between said first and second waveguides, said defined coupling length being of a size to provide that the radiant energy coupled over from said first waveguide to said second waveguide again couples over into said first waveguide at an end of said double core fiber opposite said semiconductor laser, said dispersive double core fiber providing complete crossover of laser energy from said first waveguide onto said second waveguide and complete crossover of the laser energy from said second waveguide to said first waveguide at an end of said double core fiber opposite said semiconductor laser, said laser energy being a desired wavelength for emission from said resonator;

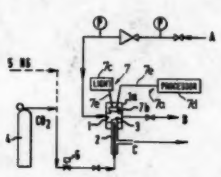
a feedback device being supplied with a radiant laser energy that is coupled over from said first waveguide into said second waveguide over a coupling length, said feedback device enabling a portion of said coupled-over radiant energy to pass from said laser transmitter as output power, said feedback device being provided at least in an area of said first waveguide at said semiconductor laser; and

an optical absorber or sum interrupting said first waveguide and disposed inside said double core fiber.

4,799,235
APPARATUS FOR MEASURING DEW-POINT OF A GAS STREAM WITH LIGHT SCATTERING

John L. K. Bannell; Arnold G. Dixon, and Trevor P. Davies, all of Chester, England, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 10, 1986, Ser. No. 872,570
Claims priority, application United Kingdom, Jun. 18, 1985, 8514584
Int. Cl.[4] G01N 25/68
U.S. Cl. 374—18 **25 Claims**



1. An apparatus for measuring condensible components in a gas stream, said apparatus comprising:

a sensor cell which includes a pressurized chamber, a probe having a reflective surface located within said pressurized chamber, said reflective surface having a slightly roughened finish which reflects scattered light when dry and diverts directly reflected light in the presence of condensate; a means for cooling at least the surface of said probe; a depression of low angle in said surface of said probe a means for transmitting light to said surface of said probe in said pressurized chamber; a means for receiving returned light scattered from said surface of said probe which is positioned to receive scattered light, but is substantially out of alignment with the path of directly reflected light; and a means for determining the presence of condensate as a predetermined function of the reduction in scattered light intensity from said surface.

4,799,236

TELECOMMUNICATION SYSTEM COMPRISING A BUS CONDUCTOR AND TELECOMMUNICATION STATIONS CONNECTED TO THIS BUS CONDUCTOR THROUGH TRANSFORMERS

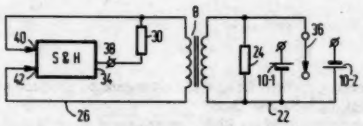
Daniël J. G. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed May 26, 1987, Ser. No. 53,987

Claims priority, application Netherlands, Jun. 18, 1986, 8601572

Int. Cl.[4] H04B *3/02*

U.S. Cl. 375—36 4 Claims



1. A telecommunication station for use in a telecommunication system comprising a plurality of such stations interconnected by a common bus conductor, each station including a coupling transformer having a plurality of windings at least one of which is coupled to the bus conductor; communication with any station being effected by transmission of a series of voltage pulses over the bus conductor which are received in the transformer winding coupled thereto and produce magnetizing current in such winding, such magnetizing current reaching a maximum value during each received voltage pulse and changing upon termination of such pulses as to generate a faulty voltage in such winding; such telecommunication station being characterized in that it comprises means connected to a winding of the coupling transformer thereof for generating a compensating current therein which changes upon termination of each received voltage pulse, such change corresponding to the maximum value of said magnetizing current and being in a direction opposite to the change in said magnetizing current upon termination of such voltage pulse; whereby the compensating current generates a voltage in the transformer winding coupled to said bus conductor substantially equal and opposite to the faulty voltage generated therein by the magnetizing current upon termination of a received voltage pulse.

4,799,237

CHANNEL-SYSTEM EXCHANGE SYSTEM FOR DIGITAL DATA RADIO-COMMUNICATION SYSTEM

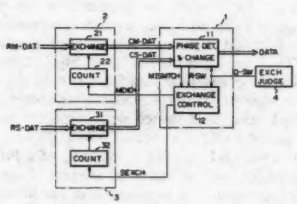
Hideaki Itoh, Chofu, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 18, 1987, Ser. No. 98,239

Claims priority, application Japan, Sep. 20, 1986, 61-220902

Int. Cl.[4] H04K *1/00*; H04L *1/02*

U.S. Cl. 375—38 12 Claims



1. A channel-system exchange system for a digital radio-communication system including at least one main radio-communication channel system and a standby communication channel system, said channel-system exchange system being provided at a reception side of each main communication channel system each main radio-communication channel system having at a transmission side a first serial-to-parallel data converter (S/PC) converting serial data to be transmitted to first channel data on the basis of a modulation method, and said standby radio-communication channel system having second S/PC at the transmission side having the same construction as said first S/PC and converting said serial data to second channel data on the basis of said modulation method, said channel-system exchange system in each main radio-communication channel system comprising:

first exchange means for exchanging said first channel data received at the reception side of said main radio-communication channel system between main channels;

second exchange means for exchanging said second channel data received at the reception side of said standby radio-communication channel system between standby channels; and

switching control means, operatively connected to said first and second exchange means, for receiving said first channel data from said first exchange means and said second channel data from said second exchange means and for switching and outputting either said first channel data or said second channel data on the basis of a channel-system exchange mode,

said switching control means detecting a phase match between said first channel data and said second channel data, shifting either said first or second data as required by said channel-system exchange mode until predetermined bits of data are shifted when said phase match is not obtained, and activating either said first or second exchange means as determined by said channel-system exchange mode when said shifting of predetermined bits of data is terminated,

said activated exchange means delaying at least one channel of the channel data therein as defined by a first relationship based upon said modulation method by one bit and exchanging said channel data between the channels therein on the basis of a second relationship defined by said modulation method, and

said switching control means repeating said phase match detection for said exchanged channel data and switching between said first and second channel data on the basis of said channel-system exchange mode when the phase match is obtained.

4,799,238

DIFFERENTIAL PHASE SHIFT KEYING METHOD FOR THE TRANSMISSION OF DATA

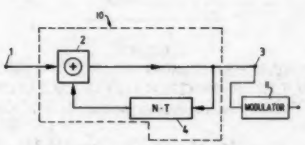
Walter Braun, Wettingen, and Walter Hagmann, Dättwil, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Jul. 15, 1987, Ser. No. 73,719

Claims priority, application Switzerland, Jul. 23, 1986, 2948/86

Int. Cl.[4] H04L *27/18*; H04B *13/00*

U.S. Cl. 375—56 6 Claims



1. Method for transmitting a sequence of symbols, comprising the steps of:

selecting symbols from the sequence of symbols at a data

rate 1/T which is equal to a predetermined number N times a fundamental frequency f_G of a disturbance signal, where $1/T = N f_G$;

coding the selecting symbols by adding to each symbol a symbol which is displaced by a time interval NT, wherein the time interval NT is equal to N times a symbol duration T, said symbol duration T being equal to the inverse of the data rate 1/T;

modulating the coded symbols by differential phase shift keying (DPSK) onto a carrier signal of a frequency f_0, said frequency f_0 being equal to a predetermined harmonic of the fundamental frequency f_G;

demodulating the carrier signal into a baseband signal;

integrating the baseband signal over the period of one symbol duration T;

sampling the integrated baseband signal at a sampling rate which is equal to the data rate 1/T; and

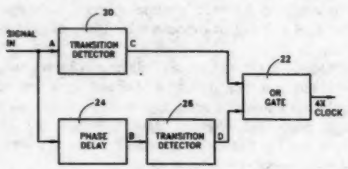
forming a phase difference between the sampled baseband signal and the same sampled baseband signal displaced by the time interval NT.

4,799,239

PHASE-COHERENT FSK SIGNAL DEMODULATOR

Sheldon Pearlman, Stanford; Anatoly Fridland, Shelton, and Gunther J. Martin, Ridgefield, all of Conn., assignors to Kidde, Inc., Westlake, Ohio

Filed Apr. 28, 1986, Ser. No. 856,777
Int. Cl.[4] H04L 27/14
U.S. Cl. 375—88 **20 Claims**



1. A system for receiving phase-coherent FSK signals having data and clock components comprising:

a plurality of subsystems;

means for carrying the data among the subsystems;

at least two of the subsystems being able to communicate by a means for transmitting and a means for receiving phase-coherent FSK signals in the subsystems;

the means for receiving including demodulation means for the data and clock components, the clock component demodulation means including a plurality of operatively parallel connected transition detectors which generate signals when the entering phase-coherent FSK data changes states and when a phase-delayed wave of the phase-coherent FSK data changes state, wherein the clock component demodulation means includes a means for combining the outputs of the transition detectors and is operatively connected thereto to form a signal which is a multiple of the clock component.

4,799,240

CLOCK SYNCHRONIZING CIRCUIT INCLUDING A VOLTAGE CONTROLLED OSCILLATOR

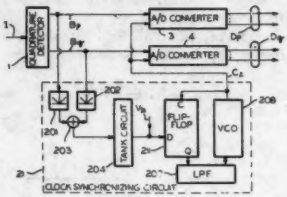
Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 15, 1986, Ser. No. 863,771
Claims priority, application Japan, May 28, 1985, 60-114518
Int. Cl.[4] H04L 7/02; H03D 3/24
U.S. Cl. 375—110 **21 Claims**

1. A clock synchronizing circuit comprising:

first means for separating a clock component from a digital modulated wave and for filtering the clock component, thereby providing an analog clock component;

second means comprising a digital flip-flop circuit responsive to a clock signal for sampling the analog clock component provided from said first means to produce a two-level digital signal; and



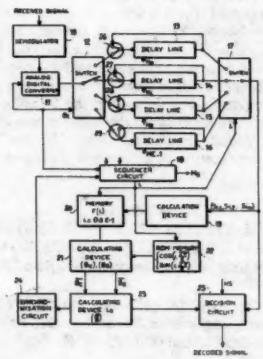
voltage controlled oscillator means responsive to said two-level digital signal for generating said clock signal.

4,799,241

METHOD AND DEVICE FOR SYMBOL SYNCHRONIZATION AND THEIR APPLICATION TO THE SYMBOL DEMODULATION OF DIGITAL MESSAGES

Pierre A. Laurent, Bessancourt, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 22, 1987, Ser. No. 99,598
Claims priority, application France, Sep. 23, 1986, 86 13286
Int. Cl.[4] H04L 7/06
U.S. Cl. 375—113 **10 Claims**



1. A method for symbol synchronization, for the symbol demodulation of a digital signal, a method wherein:

a signal is sampled to form E sequences of samples at intervals of the symbol period Ts (Si1 . . . Sij . . . SiN), i varying from 0 to E−1 and j varying from 1 to N, the samples of the same number j in two successive sequences of numbers i and i+1 being time-shifted with respect to one another by a fraction Ts/E of a symbol period Ts,

a value F (i)=F(Si1 . . . Sij, . . . , SiN) of a function F is calculated for each sequence of samples, F being chosen beforehand, according to the type of modulation used at emission, so that the nominal value of the function varies according to i and so that these variations can be identified wit those of a sine model in accordance with COS (i2π/E),

values F (i) are identified with the corresponding values of the model A+B COS ((i-io)2π/E) to determine io, io

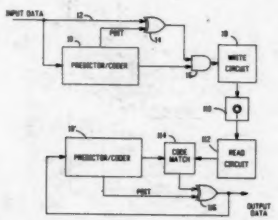
being characteristic of the synchronization time-shift to be applied to a synchronization signal of a decision circuit which performs the symbol demodulation.

4,799,242

MULTI-MODE DYNAMIC CODE ASSIGNMENT FOR DATA COMPRESSION

Johannes C. Vermeulen, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,771
Int. Cl.[4] H04B *14/06*
U.S. Cl. 375—122 **2 Claims**



1. The combination comprising:

data input means for supplying ad seriatim bits of binary characters comprising information to be compressed;

predicting means responsive to said data input means for supplying a predicted bit and a value representative of the probability that said predicted bit is equal to a corresponding bit from said data input means;

encoding means responsive to said probability value for generating a binary code word having a number of bits proportional to said probability value;

means responsive to said data input means and to said predicting means for comparing said predicted bit to a corresponding bit from said data input means;

means coupled to said encoding means and responsive to said comparing means for applying said binary code word to a utilization device if said predicted bit is not equal to the corresponding bit from said data input means;

means responsive to said data input means for comparing successive characters of said information to be compressed; and,

means responsive to said character comparing means for causing said encoding means to generate successive unique code words of fixed length for each successive same character in said information to be compressed and for causing said applying means to apply the code word associated with the last same character when a different character is found by said character comparing means.

4,799,243

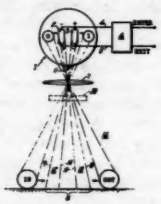
DIRECTIONAL PEOPLE COUNTING ARRANGEMENT

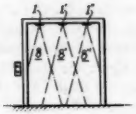
Bruce E. Zepke, Glastonbury, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Sep. 1, 1987, Ser. No. 91,622
Int. Cl.[4] G08B *13/18*; G06M *7/00*; G01J *5/08*
U.S. Cl. 377—6 **11 Claims**

1. An arrangement for detecting the passage of living beings through a surveillance region into and out of a controlled-access space, comprising at least three pyroelectric detector devices arranged side-by-side with respect to one another above an entryway to be surveilled such that the surveillance regions of said detector devices transversely span said entryway, each of said detector devices including two detector elements situated in succession in the direction of passage into the controlled-access space and each having an active area directly exposed to thermal radiation from the surveillance region and operative for converting thermal radiation energy received thereby into an electrical signal, said detector elements being coupled in such a manner that said electrical signal has one polarity for one of the detector elements and the opposite polarity for the other detector element;

means for so optically subdividing said surveillance region of each of said detector devices into two surveillance zones arranged in succession as considered in said direction that thermal radiation energy from a living being passing through the surveillance region reaches initially only one and subsequently only the other of said detector elements when such living being is entering, and initially only said other and subsequently only said one detector element when such living being is leaving, the controlled-access space, with attendant generation of said opposite polarity electrical signals by said detector device in one lead/lag time relationship for a living being entering, and in the opposite lead/lag relationship for a living being leaving, the controlled-access space through said surveillance region;





means for evaluating said electrical signals of said detector devices to provide an indication of the entry and/or exit of a living being through the respective ones of said surveillance regions from the then existing lead/lag relationship of said opposite polarity electrical signals, including at least three generating means each associated with a different one of said detector devices and operative for generating a first output signal when one of said opposite polarity signals leads the other; and further comprising a combination circuit receiving said first signals from all of said generating means and issuing a single output signal when said first signal is present from said generating means associated with the central one but not from either one of said generating means associated with the lateral ones of said detector devices, or from one but not from the other of said generating means associated with said lateral detector devices, and two output signals when said first signal is present from said generating means associated with both of said lateral detector devices.

4,799,244

SURFACE ACOUSTICAL WAVE CHARGE TRANSFER DEVICE HAVING A PLURALITY OF STATIONARY CHARGE CARRIER STORAGE PORTIONS

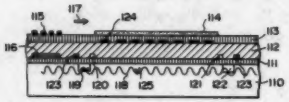
Nobuo Mikoshiba; Kazuo Tsubouchi, both of Sendai, and Makoto Nagao, Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 226,096, Nov. 11, 1981, abandoned, which is a continuation of Ser. No. 28,879, Apr. 10, 1979, abandoned. This application Jun. 30, 1986, Ser. No. 880,097

Claims priority, application Japan, Apr. 14, 1978, 53-43642; Apr. 14, 1978, 53-43868; Oct. 25, 1978, 53-165010; Dec. 18, 1978, 53-160812

Int. Cl.[4] G11C *19/28*; H01L *29/78, 27/14, 31/00*

U.S. Cl. 377—58 55 Claims



1. An image pick-up device comprising a charge transfer device of the monolithic type in which charge carriers are transferred bunched in first travelling potential wells of a potential wave accompanying an acoustic wave propagating therein where at least some of the charge carriers are generated by image-wise light exposure of the charge transfer device, said charge transfer device including acoustic wave generating means for propagating said acoustic wave in a piezoelectric layer, means for establishing a transfer channel for transferring therethrough the charge carriers, said channel comprising a depletion layer in the vicinity of the surface of a semiconductor where said piezoelectric layer and said semiconductor may comprise the same member, a detecting means for detecting the transferred charge carriers, and means for establishing a plurality of discrete charge carrier storage portions in or close to the transfer channel for storing at least some of the charge carriers generated by said image-wise light exposure of the charge transfer device, said latter means including (a) at least one electrode means disposed in proximity to said transfer channel and (b) potential applying means for applying at least one potential to said electrode means to establish a first plurality of stationary potential wells respectively corresponding to said plurality of discrete charge carrier storage portions where each of said stationary potential wells is stationary with respect to said transfer channel while said travelling potential wells move along said transfer channel, and means for changing the relationship between said stationary potential wells and said travelling potential wells between at least (a) a first relationship where the charge carriers are stored in said stationary potential wells and not transferred by said travelling potential wells and (b) a second relationship where the charge carriers are transferred from the stationary potential wells to the travelling potentials wells to be transferred along said transfer channel to said detecting means.

4,799,245

INTEGRATED CT SCANNER GANTRY

Richard T. Bernardi, Prospect Heights, Ill., assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed May 12, 1983, Ser. No. 494,104

Int. Cl.[4] G03B *41/16*

U.S. Cl. 378—15 12 Claims

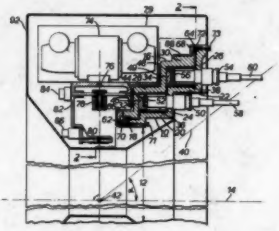
1. An integrated gantry assembly for an x-ray scanner comprising:

a. a stator having an opening along a longitudinal axis thereof of sufficient size to permit said stator to encircle a patient positioned along said axis;

b. a rotor having an opening along a longitudinal axis thereof of sufficient size to permit said rotor to encircle a patient positioned along said axis;

c. a bearing assembly located between said stator and said rotor to align said stator and rotor coaxially and to support said rotor rotatably on said stator;

d. slip ring means mounted in part on said stator and in part on said rotor and located between said rotor and stator for effecting high voltage connection from said stator to said rotor while permitting continuous rotation of said rotor, said stator and rotor defining between them first and second annular cavities each of which has a disc-shaped



opening lying in first and second planes, respectively, which planes are each perpendicular to said longitudinal axis of said stator and rotor, said first cavity having a smaller diameter than the diameter of said second cavity, one of said cavities housing a negative pancake electrode of said slip ring means an the other of said cavities and said pancake electrodes housing a positive pancake electrode of said slip ring means, said cavities being offset one from the other along said longitudinal axes of said stator and rotor; and

e. x-ray means mounted onto and supported solely by said rotor.

4,799,246

APPARATUS FOR MEASURING THE THICKNESS OF THIN LAYERS

Helmut Fischer, Industriestrasse 21, 7032 Sindelfingen, Fed. Rep. of Germany

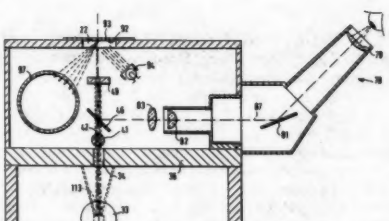
Division of Ser. No. 487,130, Apr. 21, 1983. This application May 2, 1986, Ser. No. 858,689

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239379

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.

Int. Cl.[4] G01B *15/02*

U.S. Cl. 378—50 5 Claims



1. In an apparatus for measuring the thickness of thin layers according to the X-ray fluorescence principle, having a source

of an X-ray beam with a longitudinal geometrical axis, and a viewing arrangement with an optical path, for viewing the region of the layer on which said X-ray beam falls,

a deflecting mirror arranged to be positioned in said longitudinal geometrical axis of said X-ray beam and in said optical path between said viewing arrangement and said region of said thin layer on which said X-ray beam falls,

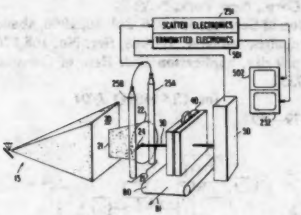
said mirror being composed of optically reflecting material and containing a hole which is arranged to be positioned in line with said longitudinal geometrical axis of said X-ray beam.

4,799,247

X-RAY IMAGING PARTICULARLY ADAPTED FOR LOW Z MATERIALS

Martin Annis, Cambridge, and Paul J. Bjorkholm, Sharon, both of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Jun. 20, 1986, Ser. No. 876,632
Int. Cl.[4] G01N *23/201*; G01T *1/20*
U.S. Cl. 378—87 **8 Claims**



1. A projection imaging system for inspecting objects for highlighting low Z materials comprising:

(a) a source of penetrating radiation,

(b) means for forming radiation emitted by said source into a beam of predetermined cross-section and for repeatedly sweeping said beam across a line in space,

(c) means for moving said object to be imaged relative to said source in a direction perpendicular to said line in space,

(d) first radiant energy detector means located to be responsive to radiant energy penetrating said object and emerging from said object, substantially unchanged in direction, for producing first electrical signals,

(e) second radiant energy detector means located further from said source than said object and responsive to radiant energy scattered by said object for producing second electrical signals,

(f) third radiant energy detector means located closer to said source than said object and responsive to radiant energy scattered by said object for producing third electrical signals,

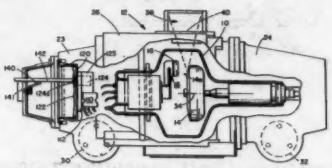
(g) display means responsive to at least a pair of said electrical signals for separately, independently and simultaneously displaying said pair of electrical signals as a function of time.

4,799,248

X-RAY TUBE HAVING MULTIPLE CATHODE FILAMENTS

Avery D. Furbee, Elmhurst; Salvatore G. Perno, Winfield, and James E. Burke, Villa Park, all of Ill., assignors to Picker International, Inc., Highland Heights, Ohio

Filed Aug. 6, 1987, Ser. No. 82,427
Int. Cl.[4] H05G *1/56*; H05J *35/06*
U.S. Cl. 378—114 **9 Claims**



1. Apparatus comprising:

(a) X-ray generating means including a cathode and an anode mounted in an evacuated chamber, said cathode having multiple filaments for emitting electrons to impinge upon a target region of said anode;

(b) housing means enclosing the X-ray generating means in an enclosure containing an insulating fluid and including a flexible wall member in part defining said enclosure to accommodate variations in the volume of said insulating fluid with temperature, said housing means supporting said X-ray generating means in a position to direct X-rays through a region of interest;

(c) connector means coupled to the housing means for energizing the X-ray generating means and having two conductors for receipt of a filament energization voltage; and

(d) selector means immersed within said insulating fluid for electrically coupling the filament energization voltage at the connector means across a selected one of said multiple filaments while electrically isolating others of said multiple filaments from said filament energization voltage and having an actuator that includes a movable contact element in close proximity to said flexible wall which can be controlled from outside the housing means to energize different ones of said multiple filaments;

(e) said housing means including an opening for insertion of a tool to engage said flexible wall in the region of said selector means to cause said flexible wall to contact and to move the movable contact element and select a different one of the multiple filaments.

4,799,249

SELF-CLEANING ROTATING ANODE X-RAY SOURCE

Arvydas P. Paulikas, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 2, 1987, Ser. No. 56,825
Int. Cl.[4] H01J *35/10*
U.S. Cl. 378—125 **6 Claims**

1. An x-ray source apparatus comprising:

a housing defining an enclosure and having an x-ray emission window therein;

means for evacuating said enclosure;

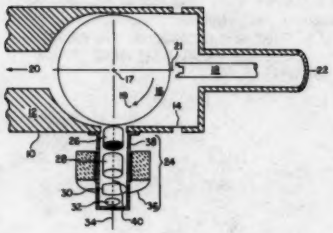
a rotatable anode means within said enclosure having a rotatable surface thereon;

a source of electrons;

means for attracting and causing movement of electrons from said source such that said electrons energetically impinge upon the rotatable surface in one region of the enclosure to produce x-rays;

means for producing ions capable of producing ions from residual particles in said enclosure, said means for producing ions located within said enclosure;

means for accelerating ions capable of accelerating ions produced by said means for producing ions such that said ions energetically impinge upon said rotatable surface in a



second region of the enclosure to sputter impurities from the surface of said anode means said means for accelerating ions located within said enclosure.

4,799,250

ROTATING ANODE WITH GRAPHITE FOR X-RAY TUBE

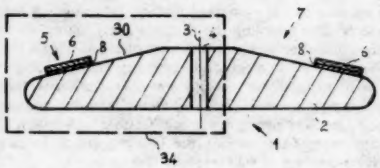
Jean M. Penato, Les Essarts le Roi; Emile Gabbay, Paris, and Yves Debrouwer, Charenton, all of France, assignors to Thomson-CGR, Paris, France

Filed Jan. 14, 1987, Ser. No. 3,142

Claims priority, application France, Jan. 17, 1986, 86 00654

Int. Cl.[4] H01J *35/10*

U.S. Cl. 378—144 **5 Claims**



1. A rotating anode of the composite type, comprising:

a first part comprising at least one target material which is capable of producing X-ray radiation upon being subjected to an electron beam; and

a second part made of graphite, said first and second parts being joined together by a bonding element comprising at least beryllium, wherein the bonding element enables the working temperature of said rotating anode to be increased.

4,799,251

ESS EQUIPMENT TESTING DEVICE

Richard B. Smith, Lagoff, and Michael T. Tolson, Elgin, both of S.C., assignors to Bell South Corporation, Atlanta, Ga.

Filed Sep. 28, 1987, Ser. No. 101,670

Int. Cl.[4] H04M *1/24*

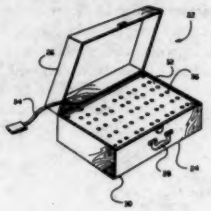
U.S. Cl. 379—1 **35 Claims**

1. A device to facilitate testing of communications systems having a number of predetermined test terminals, comprising;

a housing defining a plurality of recesses:

a plurality of electrodes mounted on said housing each electrode being positioned in a recess of said plurality of recesses, said recess being of a size sufficient for said electrode to engage a removable electrical connector;

means for connecting said plurality of electrodes to said number of predetermined test terminals; and



means for correlating said electrodes and said test terminals so that a selected electrode is an extension of a selected test terminal.

4,799,252

DIGITAL RADIO TRANSMISSION SYSTEM

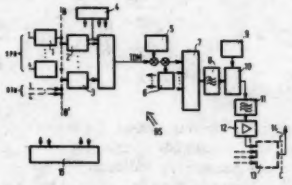
Alfons Elzenhöffer, Altdorf, and Hans-Gorg Preller, Grossenseebach, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 891,936, Jul. 30, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 168,620

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527331

Int. Cl.[4] H01Q *7/04*

U.S. Cl. 379—59 **3 Claims**

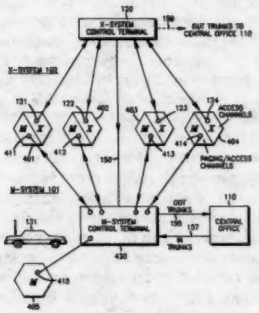


1. In a digital radio transmission system comprising a plurality of base stations and mobile stations arranged in a cellular network and wherein messages to be communicated between each base station and the respective mobile stations assigned thereto are transmitted over respective communication channels, the improvement characterized in that each base station comprises multiplexing means for multiplexing messages to be transmitted from such base station to the mobile stations assigned thereto by a combination of three different modes of multiplexing, such modes including time division multiplexing of respective time slots in successive time frames, code-division multiplexing of such time frames in accordance with respective codewords, and frequency-division multiplexing of such code division multiplexed time frames at respective carrier frequencies, the respective base stations being identified by employing respective combinations of said codewords and said carrier frequencies; and each mobile station comprises multiplexing means for multiplexing messages to be transmitted from such mobile station to the base station assigned thereto by at least one of said modes of multiplexing.

4,799,253
COLOCATED CELLULAR RADIOTELEPHONE SYSTEMS

Morton Stern, Skokie, and James Williams, Lombard, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 20, 1987, Ser. No. 75,914
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—59 13 Claims



1. A method of processing radiotelephone calls in at least first and second radiotelephone systems and a central office for providing telephone service to radiotelephones located in a geographical area, said geographical area divided into a plurality of cells, each cell assigned a plurality of voice radio channels, at least one paging/access radio channel and/or at least one access-only radio channel which differ from those radio channels assigned to adjoining cells, said first radiotelephone system including a plurality of out trunks, a plurality of inter-office trunks and a plurality of fixed site radio apparatus each located in a different cell for communicating with said radiotelephones, and said second radiotelephone system including a plurality of in trunks, a plurality of out trunks, a plurality of inter-office trunks and a plurality of fixed site radio apparatus each located in a different cell for communicating with said radiotelephones, said method comprising the steps of:

coupling out trunks of said first radiotelephone system to the central office;

coupling in trunks and out trunks of said second radiotelephone system to the central office;

coupling interoffice trunks of said first radiotelephone system to inter-office trunks of said second radiotelephone system;

locating each fixed site radio apparatus of said second radiotelephone system with the fixed site radio apparatus of said first radiotelephone system in the same cell;

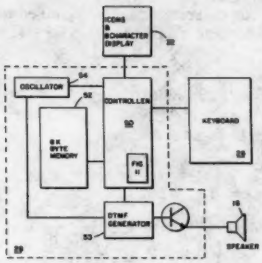
assigning for each cell at least one access-only radio channel and at least one of the plurality of voice radio channels for the cell to the fixed site radio apparatus of said first radiotelephone system located in the cell, and at least one paging/access radio channel and at least one of the plurality of voice radio channels for the cell to the fixed site radio apparatus of said second radiotelephone system located in the cell; and

directing a predetermined percentage of telephone calls originated by radiotelephones from said second radiotelephone system to said first radiotelephone system.

4,799,254
PORTABLE COMMUNICATION TERMINAL FOR REMOTE DATABASE QUERY

Douglas C. Dayton, Harvard, Mass.; Richard Bergeron, Londonderry, N.H., and Donald R. Shriner, Harvard, Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Jun. 30, 1986, Ser. No. 880,438
Int. Cl.[4] H04M 11/00
U.S. Cl. 379—97 1 Claim



1. A portable communications terminal comprising

a keyboard providing alphanumeric character keys for entering alphanumeric input signals corresponding to alphanumeric characters, and a Store key and a Send key for entering corresponding input signals,

storage means for storing digitally coded representations of characters corresponding to said alphanumeric character key input signals.

a DTMF tone generator,

output means connected to said generator, and

controller means connected to said keyboard, said storage means, and said tone generator, and responsive to an input signal coresponding to actuation of said Store key for storing digitally coded representations of alphanumeric characters corresponding to subsequent alphanumeric input signals in said storage means as a stored message string,

said controller means being thereafter responsive to an input signal corresponding to actuation of said Send Key for accessing said stored message string, and responsive to each successive digitally coded representation, for causing said generator to generate two successive DTMF tones to form a sequential pair uniquely corresponding to said corresponding alphanumeric character, for transmission by said output means,

said controller means being further responsive to actuation of said Send key for accessing said storage means and for deriving a representation of number of characters represented in said stored message string, and thereafter for causing said generator means to generate tone pairs uniquely corresponding to a start character and to a count header representing said derived representation of number.

4,799,255
COMMUNICATION FACILITIES ACCESS CONTROL ARRANGEMENT

Randy J. Billinger, Thornton; Laurel K. Dotter, Boulder, and Tommy D. Gasaway, Westminster, all of Colo., assignors to American Telephone and Telegraph Company - AT&T Information Systems, Holmdel, N.J.

Filed Jan. 30, 1987, Ser. No. 9,175
Int. Cl.[4] H04M 3/00
U.S. Cl. 379—189 5 Claims

1. In a telephone communication system, a method of detecting repetitive dialing of invalid authorization codes by a calling

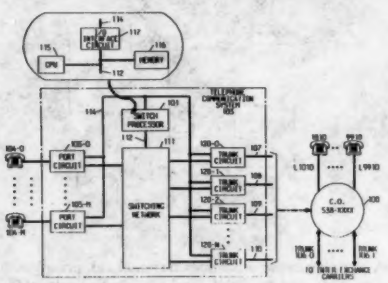
station in unauthorized attempts to access communication facilities comprising the steps of:

identifying the telephone number of said calling station for a call;

maintaining a permanent database of records based on telephone station numbers with each record comprising the number of calls made by an individual station that resulted in an unauthorized communication facility access attempt;

detecting the dialing of an invalid authorization code by said calling station in an unauthorized communication facility access attempt;

searching said database using the identified telephone number to determine if a record exists for said calling station;



creating a record in said database for said calling station upon the determination that no record exists for said calling station;

incrementing number of calls of said record for said calling station for the detected unauthorized communication facility access attempt;

comparing said number of calls of said record for said calling station to predetermined criteria; and

restricting all further access to said communication facility by said calling station for said present call and future calls when said number of calls of said record of said calling station satisfy said predetermined criteria.

4,799,256

TELECOMMUNICATION SIGNALLING ARRANGEMENT

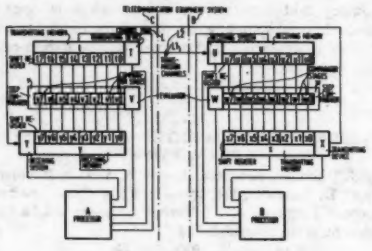
Renate Mattis; Günther Seidel, both of Munich; Heinrich Übelhack, Oberhaching, and Russel D. Homer, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,691

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 3511324

Int. Cl.[4] H04M *7/06*; H04Q *3/545*

U.S. Cl. 379—269 **11 Claims**



1. A circuit arrangement for telecommunication installations, in particular telephone exchange installations wherein there is sent ahead of each of a plurality of different communications to be transmitted corresponding type information about the type of communication actually existing, and wherein, depending on the possibly continuously varying operating situation of two telecommunication equipment systems adapted for the sending and/or receiving of communications and at least partially also for the processing thereof, one system is either ready or not ready to receive a communication to be emitted from the other system depending on the currently existing operating situation and depending on the announced type of communication, and wherein before a communication transmission a message concerning the readiness or non-readiness is transmitted in an opposite direction to the direction of transmittal of type information for the release or suppression of said communication transmission, and where, in said circuit arrangement message communications, information and messages are transmitted in bit portions of a uniform word format, characterized in that, simultaneously with type information going in the opposite direction, that is, from one telecommunication equipment system to the other system, an assortment of individual type-specific messages is transmitted concerning each of the different communication types of which each system signals to said other system the respective readiness or non-readiness individually, concerning each of the various possible communication types, and that a comparison of the type information with the respective type-specific messages in the other telecommunication equipment system leads to the release of the communication transmission or to the suppression thereof or respectively to a postponement, and that also a comparison of the type information with the respective type-specific message in the one telecommunication equipment system takes place, and that through the result thereof a next following reception of a respective communication is prepared for or skipped, and that in the latter case the reception of type information of a next following communication is prepared for.

4,799,257

WIRELESS TRANSMISSION SYSTEM FOR PM MODULATION SIGNAL

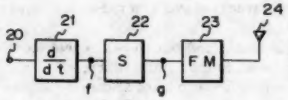
Masahichi Kishi, Tokyo; Seizo Seki, and Noboru Kanmuri, both of Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Continuation of Ser. No. 656,376, Oct. 1, 1984, abandoned. This application Nov. 5, 1987, Ser. No. 119,231

Claims priority, application Japan, Sep. 30, 1983, 58-180636; Sep. 8, 1984, 59-187277

Int. Cl.[4] H04K *1/04*

U.S. Cl. 380—9 **5 Claims**



1. A wireless transmission system for a phase modulation system using a frequency relocator means, comprising:

an input terminal for receiving an input signal to be transmitted;

a differential circuit coupled with said input terminal;

a frequency relocator coupled with an output of said differential circuit, for relocating the spectrum of input signals;

an FM modulator coupled with an output of said frequency relocator, wherein said differential circuit and said FM modulator combine to function as a phase modulation modulator and such that a modulation index of the phase modulation is not increased during said relocation of the spectrum; and

an antenna coupled with an output of said FM modulator.

4,799,258

APPARATUS AND METHODS FOR GRANTING ACCESS TO COMPUTERS

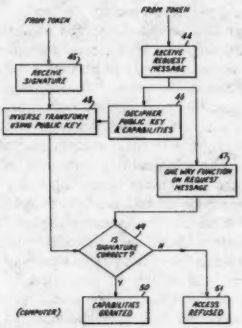
Donald W. Davies, Sunbury-on-Thames, England, assignor to National Research Development Corporation, London, England

Filed Feb. 7, 1985, Ser. No. 699,447

Claims priority, application United Kingdom, Feb. 13, 1984, 8403699; Jun. 26, 1984, 8416241

Int. Cl.[4] H04L 9/02

U.S. Cl. 380—21 **24 Claims**



1. A method of granting access to a computer comprising:

as a first preliminary step, establishing; in an authentication apparatus, a stable record of both a) a first secret key of a public key encryption system a type of access which the computer will grant and a second public key corresponding to the secret key; and

as a second preliminary step, establishing a stable record of a third key used in enciphering said enciphered information;

and additional steps employed when access is granted:

obtaining a unique message for the authentication apparatus which is different in content from other unique messages used at other times;

using the authentication apparatus to form one part of an output message to include said enciphered information produced during said first preliminary step, including said type of access information and said second public key, as enciphered in said second preliminary step, and using the secret key to encipher the unique message to generate another part of the output message;

using the computer to decipher the enciphered information to obtain information including the deciphered public key, and to decipher the enciphered unique message of the output message using the deciphered public key; and

comparing digital signals representing the result of the deciphered unique message with digital signals indicative of the unique message and granting the predetermined access to the computer only if the digital signals compared are substantially the same.

4,799,259

MONOLITHIC RANDOM DIGITAL NOISE GENERATOR

Albert V. Ogrodski, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 10, 1986, Ser. No. 850,202

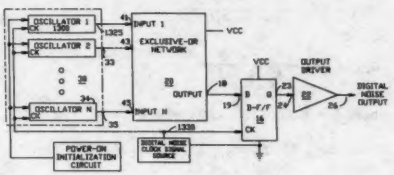
Int. Cl.[4] H04L 9/04; H03B 29/00

U.S. Cl. 380—46 **17 Claims**

1. A random digital signal generator circuit responsive to a clock signal from a clock signal source for outputting a sequential series of logic signals, each logic signal having at least a high and a low state at an output terminal comprising:

a flip-flop having a clock signal input terminal responsive to said clock signal, said flip-flop also having an input and output terminal and being further characterized to store the state of a signal at said input terminal and to provide a signal at said output terminal having a value corresponding to the state of the input signal concurrent with the clock signal until a subsequent clock signal is received in response to a clock signal;

an array of oscillator signal generators, each successive oscillator signal generator operating at a different frequency and having an output terminal and providing a periodic output signal at its respective output terminal, each respective oscillator signal generator operating asynchronously at a frequency above the frequency of said clock signal; the period of each oscillator frequency being further characterized to be different from each other



within a predetermined range and selected to obtain an irrational value for the period of each oscillator frequency;

an EXCLUSIVE-OR network means having an array of input terminals, each input terminal being coupled to the output terminal of a corresponding oscillator signal generator output terminal, for providing a random output signal at an output terminal, said EXCLUSIVE-OR means output terminal being coupled to said flip-flop input terminal;

whereby, said flip-flop responds to each said clock signal to sample the state of the random output signal at said flip-flop input terminal and to store and couple the state of said random output signal to said flip-flop output terminal until the next subsequent clock signal.

4,799,260

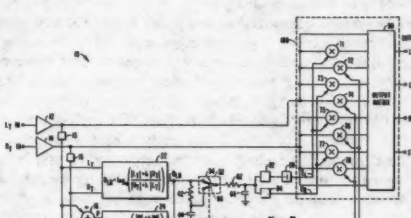
VARIABLE MATRIX DECODER

Douglas E. Mandell, Menlo Park; Craig C. Todd, Mill Valley; Ioan R. Allen, San Francisco, and Mark F. Davis, Pacifica, all of Calif., assignors to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 708,982, Mar. 7, 1985, abandoned. This application Feb. 26, 1986, Ser. No. 833,120

Int. Cl.[4] H04S 3/00

U.S. Cl. 381—22 **38 Claims**



1. A decoder for decoding two or more channel signals in a directional information system wherein at least four input signals containing directional information are encoded into the two or more channel signals, said decoder comprising:

first means for generating at least a first dominance signal indicative of the ratio of the amplitudes of a pair of the channel signals;

second means for generating at least a second dominance signal indicative of the ratio of the amplitudes of the sum of and the difference between said pair of the channel signals; and

matrix means responsive to said two or more channel signals and to said at least two dominance signals for generating a plurality of output signals for which directional effects of the output signals are enhanced, wherein the first dominance signal D_{LR} and the second dominance signal D_{CS} are given by:

$$D_{LR} = \log_a \frac{|L_T| + k|R_T|}{|R_T| + k|L_T|}$$

$$D_{CS} = \log_a \frac{|P| + k|M|}{|M| + k|P|}$$

where L_T, R_T are two channel signals

$$P = L_T + R_T,\ M = L_T - R_T,$$

and a, k are constants.

4,799,261

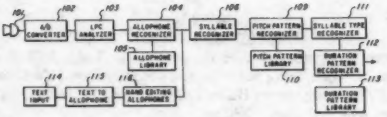
LOW DATA RATE SPEECH ENCODING EMPLOYING SYLLABLE DURATION PATTERNS

Kun-Shan Lin, and Kathleen M. Goudie, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 548,399, Nov. 3, 1983, abandoned. This application Sep. 8, 1987, Ser. No. 94,028

Int. Cl.[4] G10L 5/00

U.S. Cl. 381—36 **20 Claims**



1. A speech encoding apparatus comprising:

input means for receiving speech including one or more words of human language;

analysis means connected to said input means for analyzing said received speech, generating a sequence of phonological linguistic unit indicia corresponding to said received speech, grouping and phonological linguistic unit indicia into syllables, and generating duration data corresponding to the duration of said received speech for each phonological linguistic unit indicia, said analysis means including:

a linear predictive coding analyzer connected to said input means for providing linear predictive coding speech parameters including energy parameters, pitch parameters, and reflection coefficient parameters from the received speech,

phonological linguistic unit recognition means connected to said linear predictive coding analyzer for receiving said linear predictive coding speech parameters therefrom,

phonemic memory means having a plurality of templates of digital signals representative of phonological linguistic unit speech parameters and including standard durations corresponding to each of said phonological linguistic unit speech parameters, said phonemic memory means being connected to said phonological linguistic unit recognition means, and

said phonological linguistic unit recognition means producing speech parameters indicative of the sequence of phonological linguistic unit indicia in response to comparing said linear predictive coding speech parameters with said plurality of templates in said phonemic memory means to select the template from said phonemic memory means providing the best match to respective linear predictive coding speech parameters and generating said duration data as duration parameters based upon a standard duration of the corresponding phonological linguistic unit data stored in said phonemic memory means;

syllable recognition means connected to the output of said phonological linguistic unit recognition means and being responsive to the sequence of phonological linguistic unit indicia produced therefrom to determine syllables in which said phonological liguistic unit indicia are grouped;

duration pattern memory means storing a plurality of predetermined duration patterns corresponding to each syllable grouping of phonological linguistic unit indicia;

duration pattern recognizer means operably connected to said analysis means via said syllable recognition means and to said duration pattern memory means for selecting a duration pattern from said plurality of predetermined duration patterns for each syllable grouping of phonological linguistic unit indicia as generated by said analysis means, said duration pattern being selected in dependence upon said duration data corresponding to each syllable grouping of phonological linguistic unit indicia; and

transmission means operably connected to said analysis means and said duration pattern recognizer means for transmitting said speech parameters indicative of said phonological liguistic unit indicia and duration parameters indicative of duration pattern indicia corresponding to said selected duration patterns as encoded speech data from which audible synthesized speech having a duration contour approximating the duration contour of the original speech as received by said input means may be produced while employing a relatively low data rate.

4,799,262

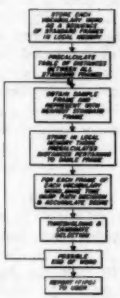
SPEECH RECOGNITION

Joel A. Feldman, Cambridge; William F. Ganong, III, Brookline, and Scott Brudner, Cambridge, all of Mass., assignors to Kurzweil Applied Intelligence, Inc., Waltham, Mass.

Filed Jun. 27, 1985, Ser. No. 749,582

Int. Cl.[4] G10L 5/00

U.S. Cl. 381—43 **3 Claims**



1. A method for electronically recognizing spoken words which comprises:

transducing acoustic speech waveforms to obtain a corresponding electric signal;

obtaining from said signal a sequence of digital values char-

acterizing the waveforms, said digital signals representing, at a given sample time, a frame of speech information;

generating a representative list of standard frames represented by encoded indices;

precomputing and storing a table of difference values representing the distances between each standard frame in said list and all other standard frames in said list;

for each token word which is to be recognized, generating and storing in a first local memory a sequence of standard frame indices which represent that token word;

recognizing sample speech by, as each sample frame is generated,

finding a representative standard frame which best represents the sample frame,

extracting from the table those difference values which pertain to said representative standard frame and storing those extracted values in a second local memory,

for each token word in sequence obtaining from said second local memory the corresponding difference values which represent the token word relative to the representative sample frame and incrementing a respective accumulating value by a value which is a function of the respective difference value

whereby token words can be matched to the sample speech on the basis of the relative magnitudes of the respective accumulating values.

4,799,263

SPEAKING AND HEARING SYSTEM FOR BREATHING APPARATUS

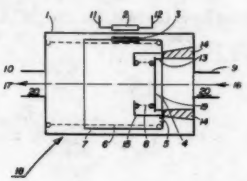
Fritz A. Bänziger, Gross Wesenberg, and Peter Klein, Delmenhorst, both of Fed. Rep. of Germany, assignors to Dragerwerk AG, Fed. Rep. of Germany

Filed Mar. 18, 1987, Ser. No. 27,344

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609097

Int. Cl.[4] H04M 9/00

U.S. Cl. 381—94 **8 Claims**



1. A device for regulating a voice communication system for a breathing apparatus which has at least one respiratory gas line through which breathing gases are passed for inhalation or exhalation or both, comprising a switching device located in the respiratory gas line and permitting a flow of gas therethrough, a member in said switching device in the gas flow movable in response to the gas flow, and an electrical breathing noise suppressant circuit connected to the voice communication system and associated with said member and actuated by movement of said member for suppressing breathing noises.

4,799,264

SPEAKER SYSTEM

Jan P. Plummer, 5104 Afton Way, Smyrna, Ga. 30080

Filed Sep. 28, 1987, Ser. No. 101,395

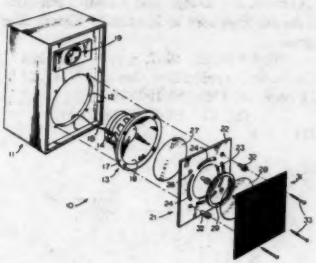
Int. Cl.[4] H04R 7/26

U.S. Cl. 381—158 **12 Claims**

1. A speaker system comprising a housing having an opening, at least one speaker including a driver and a cone responsive to said driver mounted for vibrating movement within said housing with the mouth of the cone located adjacent said housing opening whereby the driver may cause the cone to vibrate and generate sound waves having distortions inherent in sound produced by speaker cones that propagate out of the housing through the opening, and acoustical filter means mounted adjacent said cone mouth for intercepting the sound waves and reradiating them with the distortions attenuated;

wherein said filter means comprises a substantially rigid frame having an aperture formed therein and a first membrane mounted to a first side of said frame member covering said aperture;

wherein said first membrane has a resonant frequency of



vibration, and wherein said speaker system further comprises means for dampening membrane vibration at said resonant frequency; and

wherein said speaker system further comprises a second membrane mounted to a second side frame member covering said aperture and having a resonant frequency of vibration; said first and second membranes defining a confined air space there between and within said aperture whereby said second membrane vibrates synchronously with and in response to vibrations of said first membrane.

4,799,265

ELECTROSTATIC TRANSDUCER UNIT

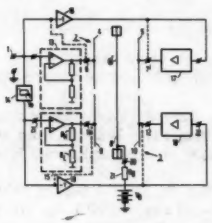
Johannes H. Streng, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1987, Ser. No. 68,868

Claims priority, application Netherlands, Jul. 8, 1986, 8601772

Int. Cl.[4] H04R 3/00

U.S. Cl. 381—116 **9 Claims**



1. A device for converting an electric signal into an acoustic signal, comprising an input terminal for receiving the electric signal, an amplifier unit having an input coupled to the input terminal, and an output, and an electrostatic transducer unit coupled to the output of the amplifier unit, the electrostatic transducer unit comprising N electrostatic transducers, N being larger than or equal to 2, characterized in that the diaphragms of the N electrostatic transducers form part of a diaphragm which is common to all transducers, in that the amplifier unit comprises N sub-amplifiers, in that the input terminal is coupled to a first input of the first electrostatic

transducer via a first sub-amplifier, the input terminal is coupled to a first input of the (i+1)th electrostatic transducer via a series arrangement of an i-th low-pass filter and an (i+1)th sub-amplifier (in this order), which (i+1)th sub-amplifier is of the feedback type, i ranging from 1 to N−1 inclusive, and in that if N>2 a low-pass filter of a higher sequence number i has a lower cut-off frequency.

4,799,266

ELECTROACOUSTIC CONVERTER

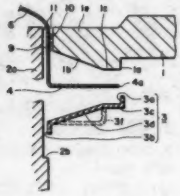
Yoshio Sakamoto, Hachiohji, and Kaoru Yamazaki, Akikawa, both of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,205

Claims priority, application Japan, Nov. 25, 1986, 61-179694[U]; Nov. 26, 1986, 61-180562[U]

Int. Cl.[4] H04R 7/18, 7/20

U.S. Cl. 381—193 **3 Claims**



1. An acoustic converter comprising:

(a) a magnetic circuit including a center pole, a magnet and a top plate, an air gap being formed between an upper side surface of the center pole and an adjacent end of the top plate, the center pole including a ledge on a vertical surface thereof, and the top plate including an incision on a horizontal rear surface therof and a horizontal part adjacent to the incision;

(b) a diaphragm system including a dome-like diaphragm, a cylindrical bobbin on which a voice coil is wound and a brim-like suspension which extends from the bobbin; and

(c) a guide ring bridged between the ledge of the center pole and the incision of the top plate, the guide ring including a horizontal part on the periphery thereof;

wherein the periphery of the suspension of the diaphragm system is fixedly sandwiched between the horizontal part of the guide ring and the horizontal surface of the top plate.

4,799,267

IMAGE PROCESSING APPARATUS AND PROCESSING METHOD

Kohji Kamejima, Chiyoda; Yoshiyuki Nakano, Hitachi; Masakatsu Fujie, Ushiku; Taro Iwamoto, Mito, and Hiroshi Yamamoto, Chiyoda, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

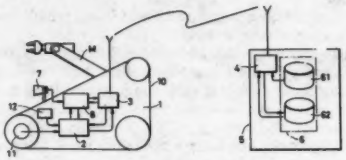
Continuation of Ser. No. 536,874, Sep. 29, 1983, abandoned. This application Dec. 24, 1986, Ser. No. 946,007

Claims priority, application Japan, Oct. 22, 1982, 57-184537

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—1 **9 Claims**

1. In an apparatus which processes three dimensional topographical information on the arrangement of roads, buildings, obstacles and the like, which are not necessarily located perpendicularly to a direction of movement of an automatic traveling object, for controlling movement of an automatic traveling object, an image processing apparatus comprising: image input means mounted on the automatic traveling object for viewing a surrounding landscape and providing an output signal representing a two dimensional intensity distribution of light reflected or emitted from roads, buildings, obstacles and the like; storage means for storing three dimensional map data as to the arrangement of the roads, building, obstacles and the like in an area where the automatic traveling object is to move; predicting means connected to said storage means for predicting an output of said image input means for a given location of the automatic traveling object by producing a signal representing a predictive two dimensional intensity distribution of light reflected or emitted from roads, building, obstacles and the like on the basis of said three dimensional map data; means for comparing an output signal representing an actual two dimen-



sional input intensity distribution of light reflected or emitted from roads, buildings, obstacles and the like from said image input means and the signal representing the predictive two dimensional intensity distribution of light reflected or emitted from roads, buildings, obstacles and the like and for obtaining a difference two dimensional intensity distribution of light reflected or emitted from roads, buildings, obstacles and the like; and correction means connected to said comparing means for updating map data in said storage means on the basis of said difference two dimensional intensity distribution of light reflected or emitted from roads, buildings, obstacles and the like.

4,799,268

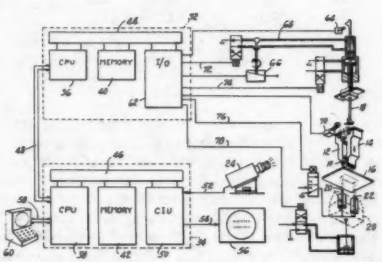
LEAD SENSE SYSTEM FOR COMPONENT INSERTION MACHINE

Jean A. McLean, So. Hamilton, and Robert J. Duncan, Magnolia, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Nov. 12, 1985, Ser. No. 797,322

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—8 **11 Claims**



1. A machine for inserting electronic components, such as dip components, having a pair of rows of parallel leads, running from one end of a component to the other end and defining the sides of the component, into holes of a printed circuit board comprising:

means for inserting the parallel leads of a component into holes of the printed circuit board so that the leads extend beyond the bottom surface of the printed circuit board,

camera means,

means for mounting said camera means on one side of the leads at an angle to the rows of parallel leads selected so that said camera means will see the leads of one row spaced from the leads of the other row,

means for making each of the leads extending beyond the bottom surface of the printed circuit board appear dark to said camera means with the rest of the image seen by the camera appearing light including

light source means and

means for mounting said light source means at the opposite side of the leads to direct light toward the bottom surface of the printed circuit board proximate the leads so that it will reflect towards said camera means thereby presenting to said camera means a pattern of dark spots corresponding to the leads extending beyond the printed circuit board, and

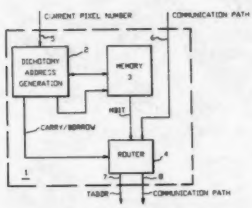
means for comparing the pattern of dark spots seen by said camera means with the pattern which the camera would see if all the leads were present in the inserted component and stopping said machine if the patterns do not match.

4,799,269

TABLE LOOKUP ADDRESSING BY DICHOTOMY WINDOW GENERATION

Hungwen Li, Pleasantville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1987, Ser. No. 15,840
Int. Cl.[4] G06K 9/56
U.S. Cl. 382—27 **3 Claims**



1. A method for arbitrarily accessing a window of K×K pixels in a N×N array stored image, in a constant unit memory cycle, comprising the following steps:

decomposing the N×N pixel array image into M×M pixel array subimages of size N/M×N/M, each pixel of the subimage being identifiable by a pixel identifier number and each pixel having communication with each of a plurality of neighboring cells comprising the window via a receiving port and a sending port;

generating a dichotomy address by dividing a current pixel identifier number into a plurality of partial addresses;

manipulating said partial addresses to develop related addresses corresponding to the pixels comprising the window;

concatenating said partial addresses and said related addresses into an expanded address set;

providing a memory table of plural memory banks, each bank having a plurality of words; and

addressing said memory table by said expanded address set to extract from said memory table a plurality of words defining the bits of the window.

4,799,270

IMAGE CLASSIFIER

Boris F. Kim, Laurel, and Joseph Bohandy, Columbia, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Mar. 20, 1986, Ser. No. 841,658
Int. Cl.[4] G06K 9/62
U.S. Cl. 382—27 **13 Claims**

1. An imaging system comprising:

a. providing an image;

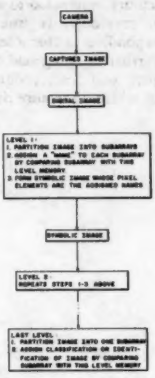
b. electronically processing the image to produce a digital image;

c. at least one level of identification, partitioning the image from the previous step into subarrays;

d. comparing the content of each subarray with memory elements of that level of identification;

e. assigning a symbol to each subarray, said symbol being the symbol of the memory element matching the content of the subarray, wherein the assigned symbol is a pixel element in a symbolic image for the next level;

f. repeating step e. until all subarrays have assigned symbols;



g. forming the symbolic image from the assigned symbols;

h. repeating recursively steps c. through g. until all levels of identification have been completed;

i. as a last level, forming a single subarray of pixel elements of the symbolic image formed in the preceding level;

j. comparing the content of the single subarray with the memory elements of the last level; and,

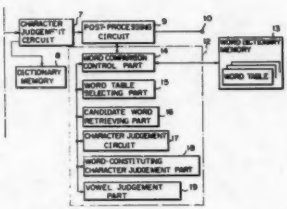
k. assigning a name to the subarray, said name being the name of the memory element in the last level matching the content of the single subarray and naming the image of step a.

4,799,271

OPTICAL CHARACTER READER APPARATUS

Hikoshi Nagasawa; Kazuo Ito; Shigeru Horii, and Katsuhide Tanoshima, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1987, Ser. No. 27,408
Claims priority, application Japan, Mar. 24, 1986, 61-63973
Int. Cl.[4] G06K 9/03
U.S. Cl. 382—40 **9 Claims**



1. An optical character reader apparatus comprising:

(a) an optical system for converting characters written on a

document card to an optical signal and for converting said optical signal to an electrical signal;

(b) a pre-processing circuit connected to said optical system for converting said electrical signal into a binary picture image signal, and for extracting a picture image corresponding to one character from said binary picture image signal;

(c) a feature extracting circuit connected to said pre-processing circuit for extracting features of said one character in conformity with a predetermined procedure;

(d) a character judgement circuit connected to said feature extracting circuit for effecting a comparison of said one character;

(e) a dictionary memory connected to said character judgement circuit for previously registering feature data of characters corresponding to character codes of said characters, and for further enabling said character judgement circuit to compare said feature data from said feature extracting circuit with said feature data registered in said dictionary memory and for delivering character codes of coincident characters in response to said comparison;

(f) a post-processing circuit connected to said character judgement circuit and an output terminal for effecting editing and output control corresponding to said judgement in said character judgement circuit;

(g) a vowel judgement part connected to said word comparison control part for judging whether or not respective constituent characters of the extracted words are vowels when said number of characters constituting the word extracted in said word constituting character number judgement part is greater than a prescribed number, and if so, eliminating a constituent character judged to be a vowel from among said constituent characters being compared; and

(h) a word comparison circuit connected to said post-processing circuit for effecting word comparison in cooperation with said circuit.

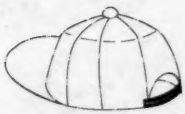
DESIGN PATENTS

GRANTED JAN. 17, 1989

ERRATA

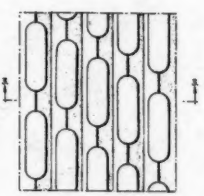
For CLASS	See PATENT NO.
D17-020	299,453

299,380
ADJUSTABLE HAT BUCKLING BELT
Li-Yu Wang, 38, Lane 479, Pei-Tun Road, Taichung City, Taiwan
Filed Jan. 14, 1986, Ser. No. 818,586
Term of patent 14 years
U.S. Cl. D2—261



299,381
INSOLE
James C. Hauser, Palos Verdes, Calif., assignor to Walk-on-Water, Inc., Los Angeles, Calif.
Filed Jul. 14, 1986, Ser. No. 885,276
Term of patent 14 years
U.S. Cl. D2—318

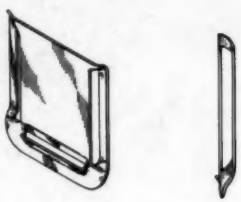
299,382
SHOE SOLE MATERIAL
Juan A. Diaz, Weymouth, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Jul. 16, 1987, Ser. No. 74,317
Term of patent 14 years
U.S. Cl. D2—320



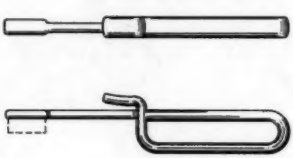
299,383
NECKTIE OR SIMILAR ARTICLE
Robert Rosenbaum, 1043 Arbor La., Glenview, Ill. 60025
Filed Oct. 23, 1985, Ser. No. 790,396
Term of patent 14 years
U.S. Cl. D2—605

299,384
DIAPER BAG
Karen A. Donnor, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Aug. 2, 1985, Ser. No. 762,137
Term of patent 14 years
U.S. Cl. D3—53

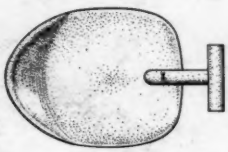
299,385
BELT MOUNTED RULE HOLDER
Edward C. Rutty, Portland, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Sep. 9, 1985, Ser. No. 773,469
Term of patent 14 years
U.S. Cl. D3—100



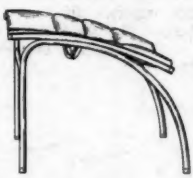
299,386
ARTHRITIC TOOTHBRUSH
Melissa N. Jacobs, 4807 Marlborough Way, Carmichael, Calif. 95608
Filed Mar. 3, 1986, Ser. No. 841,365
Term of patent 14 years
U.S. Cl. D4—104



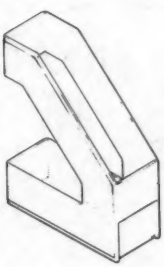
299,387
COMBINED SWIVEL CHAIR AND FIREARM SUPPORT FOR A SPORTSMAN
Albert Ansaldo, c/o Sunshine Painting, 1020 Edison Dr., San Antonio, Tex. 78201
Filed Aug. 28, 1986, Ser. No. 901,454
Term of patent 14 years
U.S. Cl. D6—335



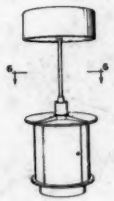
299,388
OTTOMAN
Richard Frinier, Long Beach, Calif., assignor to Brown Jordan Company Limited Partnership, El Monte, Calif.
Filed Sep. 16, 1986, Ser. No. 908,141
Term of patent 14 years
U.S. Cl. D6—349



299,389
PAMPHLET HOLDER
Gerald J. Klodt, Madison, Wis., assignor to W. T. Rogers Company, Madison, Wis.
Filed Oct. 1, 1985, Ser. No. 782,361
Term of patent 14 years
U.S. Cl. D6—407



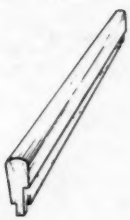
299,390
PHOTO FILM DROP STAND
Stephen W. Van Cleave, Kensington, Ohio, assignor to Tusco Manufacturing Company, Gnadenhutten, Ohio
Filed Jun. 23, 1986, Ser. No. 877,723
Term of patent 14 years
U.S. Cl. D6—436



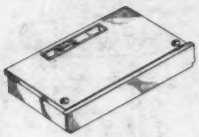
299,391
MERCHANDISE COOLER
Kermit E. Meehan, Wayzata, Minn., assignor to The Mike Meehan Company, Minnetonka, Minn.
Filed Dec. 26, 1985, Ser. No. 813,402
Term of patent 14 years
U.S. Cl. D6—440

299,392
DISPLAY RACK
John D. Hunt, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Jun. 11, 1986, Ser. No. 743,257
Term of patent 14 years
U.S. Cl. D6—479

299,393
BED RAIL PAD
Donald E. Sands, 2701 Chapel Pike, Marion, Ind. 46952
Filed Feb. 7, 1986, Ser. No. 827,105
Term of patent 14 years
U.S. Cl. D6—503

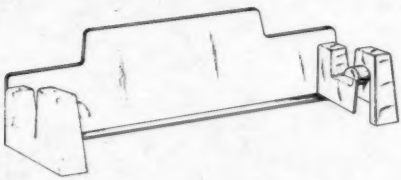


299,394
DRAWER WITH REFERENCE SHELF
Norman A. Hedstrom, Worcester, Mass., assignor to Wright Line, Inc., Worcester, Mass.
Filed May 12, 1986, Ser. No. 862,584
Term of patent 14 years
U.S. Cl. D6—510

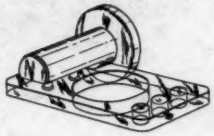


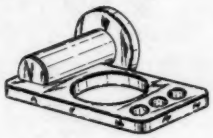
299,395
COUNTER TOP
Harry C. Osvold, 8405 Wesley Dr., Golden Valley, Minn. 55427
Filed May 15, 1986, Ser. No. 863,472
Term of patent 14 years
U.S. Cl. D6—511

299,396
MAGNETIC-MOUNT PAPER TOWEL HOLDER
Stephen T. Meyer, Carmel, Ind., assignor to Deflecto Corporation, Indianapolis, Ind.
Filed Dec. 8, 1986, Ser. No. 939,013
Term of patent 14 years
U.S. Cl. D6—522

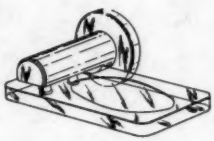


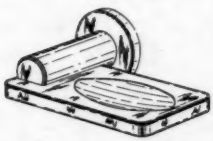
299,397
COMBINED TOOTHBRUSH AND TUMBLER HOLDER
Peter S. Fayerman, Bryn Mawr, and Leslie A. Meck, Blandan, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Oct. 18, 1985, Ser. No. 789,172
The portion of the term of this patent subsequent to Nov. 29, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—531





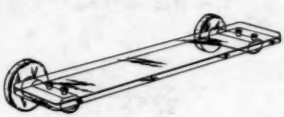
299,398
SOAP DISH
Peter S. Fayerman, Bryn Mawr, and Leslie A. Meck, Blandan, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Oct. 18, 1985, Ser. No. 789,167
Term of patent 14 years
U.S. Cl. D6—540



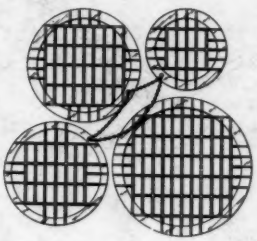


299,399
FLUID DISPENSER
Jerome Lippman, 3342 W. Smith Rd., Akron, Ohio 44313
Filed Apr. 28, 1986, Ser. No. 857,774
Term of patent 14 years
U.S. Cl. D6—545

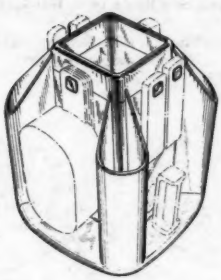
299,400
WALL SHELF
Peter S. Fayerman, Bryn Mawr, and Leslie A. Meck, Blandan, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Oct. 18, 1985, Ser. No. 789,178
Term of patent 14 years
U.S. Cl. D6—572



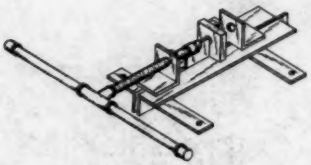
299,401
CAKE ICING MARKER SET
Ida M. Ryan, 327 S. High, Neosho, Mo. 64850
Filed Feb. 3, 1986, Ser. No. 825,759
Term of patent 14 years
U.S. Cl. D7—43



299,402
UTENSIL CADDY
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jan. 15, 1988, Ser. No. 144,081
Term of patent 14 years
U.S. Cl. D7—73

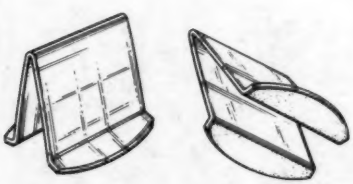


299,403
NUT CRACKER
Richard L. Walker, Rte. 2, Box 216, Seymour, Mo. 65746
Filed Jan. 22, 1986, Ser. No. 821,240
Term of patent 14 years
U.S. Cl. D7—98

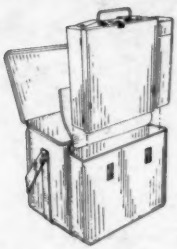


299,404
MODIFIED CRAB MALLET
John Demanczyk, Sr., 1321 Sycamore Ave., Elsmere, Del. 19805
Filed May 5, 1986, Ser. No. 859,745
Term of patent 14 years
U.S. Cl. D7—101

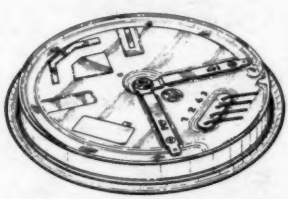
299,405
COFFEE FILTER LIFTER
William Bothmann, Star Route 1079, Trabuco Canyon, Orange, Calif. 92667
Filed May 12, 1986, Ser. No. 862,598
Term of patent 14 years
U.S. Cl. D7—105



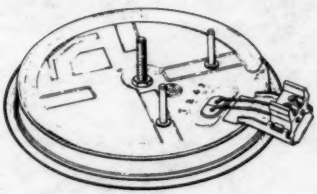
299,406
COMBINED INSULATED CONTAINER AND COLLAPSIBLE GRILL
Jeffrey M. Jacober, Walmsly La., South Kingston, R.I. 02874
Filed Sep. 22, 1986, Ser. No. 910,748
Term of patent 14 years
U.S. Cl. D7—332



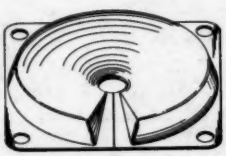
299,407
ELECTRIC HOTPLATE
Robert Kicherer, and Felix Schreder, both of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany
Filed Oct. 6, 1986, Ser. No. 916,027
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1986, II/141
Term of patent 14 years
U.S. Cl. D7—367



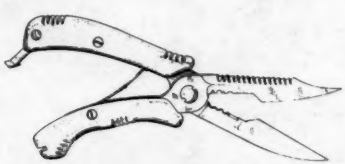
299,408
ELECTRIC HOTPLATE
Robert Kicherer, and Felix Schreder, both of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany
Filed Oct. 6, 1986, Ser. No. 916,028
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1986, MR II/141 BR
Term of patent 14 years
U.S. Cl. D7—367



299,409
SEEDLING PROTECTOR
Douglas R. Inglis, 4111 E. Packard Hwy., Charlotte, Mich. 48813
Filed May 22, 1986, Ser. No. 866,105
Term of patent 14 years
U.S. Cl. D8—1

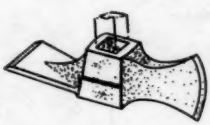


299,410
SCISSORS
Moris Baroni, Via Vittorio Alfieri 3/4, 40128 Bologna, Italy
Filed Jul. 20, 1987, Ser. No. 75,919
Term of patent 14 years
U.S. Cl. D8—52

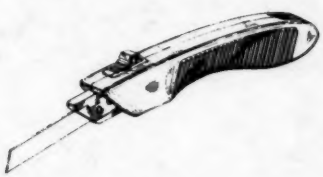


299,411
PNEUMATIC HAMMER
Dino C. Porcaro, Racine, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.
Filed Feb. 10, 1986, Ser. No. 827,754
Term of patent 14 years
U.S. Cl. D8—68

299,412
AXE
Ron Zabarte, 70 Alberta Terr., Walnut Creek, Calif. 94596
Filed Oct. 5, 1987, Ser. No. 104,490
Term of patent 14 years
U.S. Cl. D8—76



299,413
FOLDING POCKET SAW HANDLE
Joseph P. DeCarolis, Bristol, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Jul. 17, 1985, Ser. No. 755,919
Term of patent 14 years
U.S. Cl. D8—97



299,414

AXE-TYPE COMBINATION TOOL

Stefan Bajza, 88 De France Way, Golden, Colo. 80401; Roger A. Strom, 8828 E. Florida, Denver, Colo. 80231, and Harriet G. Bajza, 88 E. France Way, Golden, Colo. 80401

Filed Mar. 28, 1986, Ser. No. 847,021

Term of patent 14 years

U.S. Cl. D8—105

299,415

HANDLE FOR REFRIGERATOR DOOR

Tetsuo Takahashi, Tokyo, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1986, Ser. No. 899,600

Term of patent 14 years

U.S. Cl. D8—302

299,416

HANDLE FOR REFRIGERATOR DOOR

Tetsuo Takahashi, Tokyo, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1986, Ser. No. 899,601

Term of patent 14 years

U.S. Cl. D8—302

299,417

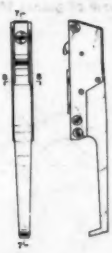
HANDLE FOR REFRIGERATOR DOOR

Tetsuo Takahashi, Tokyo, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1986, Ser. No. 899,604

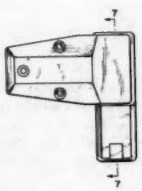
Term of patent 14 years

U.S. Cl. D8—302

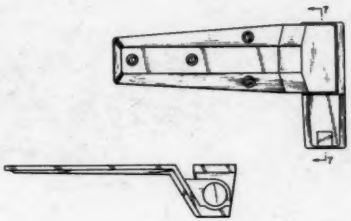


299,418
HINGE FOR REFRIGERATOR DOOR
Tetsuo Takahashi, Tokyo, Japan, assignor to Takigen Manufacturing Co. Ltd., Tokyo, Japan
Filed Aug. 25, 1986, Ser. No. 899,616
Term of patent 14 years
U.S. Cl. D8—323

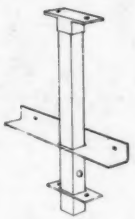
299,419
HINGE FOR REFRIGERATOR DOOR
Tetsuo Takahashi, Tokyo, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan
Filed Aug. 25, 1986, Ser. No. 899,615
Term of patent 14 years
U.S. Cl. D8—329



299,420
HINGE FOR REFRIGERATOR DOOR
Tetsuo Takahashi, Tokyo, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan
Filed Aug. 25, 1986, Ser. No. 899,620
Term of patent 14 years
U.S. Cl. D8—329

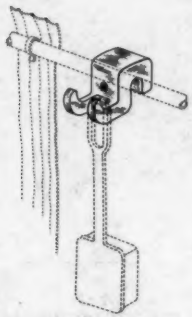


299,421
SECURITY BAR FOR PROTECTION OF POOL TABLE COIN BOXES
Stanley W. Pearson, 1601 Cambridge Drive, Kinston, N.C. 28501
Filed Mar. 6, 1986, Ser. No. 842,000
Term of patent 14 years
U.S. Cl. D8—331

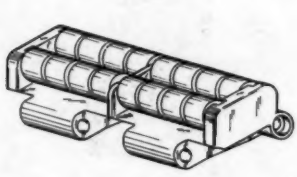


299,422
COMBINED ANNUNCIATOR AND TELEPHONE JACK WALL PLATE AND A JUNCTION BOX THEREFOR
William W. Williamson, Somerset, Wis., and Robert E. Brunius, St. Paul, Minn., assignors to Interactive Technologies, Inc., North St. Paul, Minn.
Filed Jun. 13, 1986, Ser. No. 874,363
Term of patent 14 years
U.S. Cl. D8—353

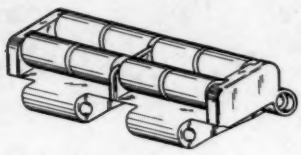
299,423
HOLDER FOR A SHOWER BRUSH OR SIMILAR ARTICLE
George T. Davis, P.O. Box 20675, Los Angeles, Calif. 90006
Filed Sep. 9, 1987, Ser. No. 94,851
Term of patent 14 years
U.S. Cl. D8—373



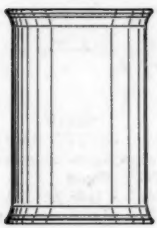
299,424
CHAIN LINK
Roger H. Schroeder, Hartland, and Wasyly G. Hodlewsky, Greendale, both of Wis., assignors to Rexnord Inc., Brookfield, Wis.
Filed Jun. 17, 1985, Ser. No. 745,092
The portion of the term of this patent subsequent to Jan. 17, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—499



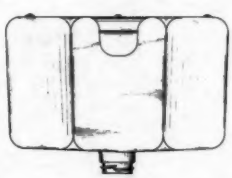
299,425
CHAIN LINK
Roger H. Schroeder, Hartland, and Wasyly G. Hodlewsky, Greendale, both of Wis., assignors to Rexnord Inc., Brookfield, Wis.
Filed Jun. 17, 1985, Ser. No. 745,476
The portion of the term of this patent subsequent to Jan. 17, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—499



299,426
CAN
Arne Andersson, Sparres vag 53, and Lars-Eric Piltz, Konventsvag 3, both of S-240 10 Dalby, Sweden
Filed Mar. 21, 1985, Ser. No. 714,712
Claims priority, application Sweden, Sep. 25, 1984, 2550/84
Term of patent 14 years
U.S. Cl. D9—368

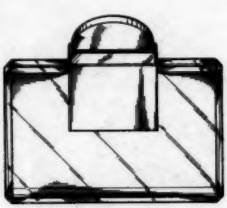


299,427
SOAP CARTRIDGE
Robert L. Steiner, Chicago, and Thomas Bajek, Berwyn, both of Ill., assignors to Steiner Company, Inc., Chicago, Ill.
Filed Apr. 22, 1985, Ser. No. 725,993
Term of patent 14 years
U.S. Cl. D9—370

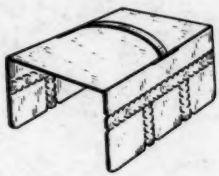


299,428
BOTTLE
Arthur E. Wilfond, Edison, N.J., assignor to Boyle-Midway Household Products, Inc., New York, N.Y.
Continuation of Ser. No. 736,721, May 22, 1985. This application Jul. 23, 1987, Ser. No. 77,070
Term of patent 14 years
U.S. Cl. D9—373

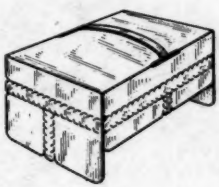
299,429
BOTTLE
Pierre Dinand, Levallois-Perret, France, assignor to Florbath - Profumi Di Parma, Parma, Italy
Filed Sep. 23, 1985, Ser. No. 779,028
Claims priority, application France, Mar. 21, 1985, 85 1320
Term of patent 14 years
U.S. Cl. D9—413



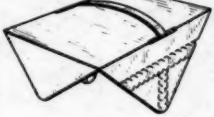
299,430
CARRIER/PACKAGE BLANK
Nils-Ake Gustafsson, Halmstad, Sweden, assignor to Sprinter Pack AB, Sweden
Filed Aug. 16, 1985, Ser. No. 766,850
Claims priority, application United Kingdom, Feb. 20, 1985, 1.025.153
Term of patent 14 years
U.S. Cl. D9—433



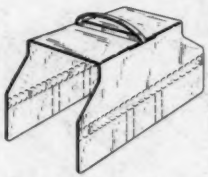
299,431
CARRIER/PACKAGE BLANK
Nils-Ake Gustafsson, Halmstad, Sweden, assignor to Sprinter Pack AB, Sweden
Filed Aug. 16, 1985, Ser. No. 766,899
Claims priority, application United Kingdom, Feb. 20, 1985, 1025152
Term of patent 14 years
U.S. Cl. D9—433



299,432
CARRIER/PACKAGE BLANK
Nils-Ake Gustafsson, Halmstad, Sweden, assignor to Sprinter Pack AB, Sweden
Filed Aug. 16, 1985, Ser. No. 766,900
Claims priority, application United Kingdom, Feb. 20, 1985, 1025154
Term of patent 14 years
U.S. Cl. D9—433

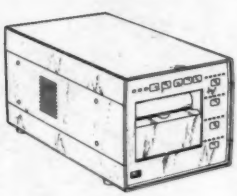


299,433
CARRIER PACKAGE BLANK
Nils-Ake Gustafsson, Halmstad, Sweden, assignor to Sprinter Pack AB, Sweden
Filed Aug. 13, 1986, Ser. No. 895,922
Claims priority, application Sweden, Feb. 21, 1986, 86-0444
Term of patent 14 years
U.S. Cl. D9—433

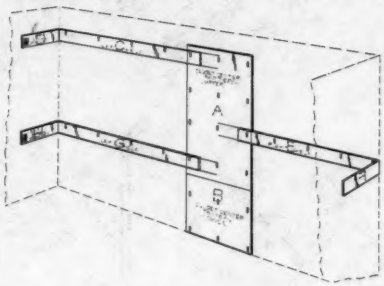


299,434
CLOSURE CLIP UNIT
Charles E. Burford, Dallas, Tex., assignor to Burford Corp., Maysville, Okla.
Filed Nov. 7, 1985, Ser. No. 803,924
Term of patent 14 years
U.S. Cl. D9—435

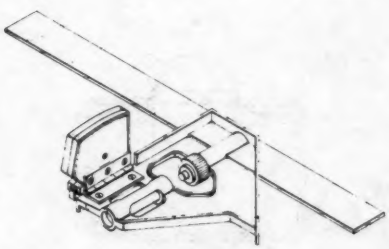
299,435
THERMAL RECORDER
Kazuhiro Kuwa, and Kiwamu Yoneda, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Jul. 24, 1985, Ser. No. 758,019
Claims priority, application Japan, Apr. 25, 1985, 60-2343
Term of patent 14 years
U.S. Cl. D10—46



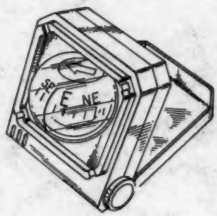
299,436
CLOSET SHELVING TAPE AND DRILL PATTERN
William H. Muth, Ocala, Fla., assignor to Clairson Corporation, Ocala, Fla.
Filed Dec. 20, 1985, Ser. No. 811,390
Term of patent 14 years
U.S. Cl. D10—62



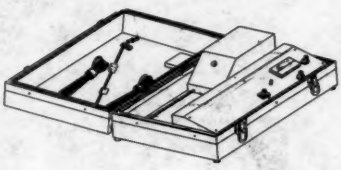
299,437
COMBINED SQUARE AND TAPE MEASURE
Andrew W. Kull, 157 Hughes Pl., Albertson, N.Y. 11507
Filed Jun. 26, 1986, Ser. No. 879,181
Term of patent 14 years
U.S. Cl. D10—62



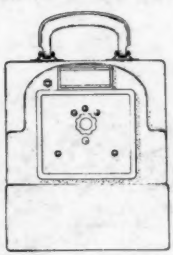
299,438
FLIP UP MODULAR COMPASS FOR AUTOMOBILE CONTROL PANELS
Marc R. Iacovelli; Pierre Chart, and Duke Kraai, all of Miami, Fla., assignors to Rally Manufacturing, Inc., Miami, Fla.
Filed May 7, 1986, Ser. No. 860,762
Term of patent 14 years
U.S. Cl. D10—68



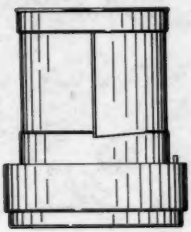
299,439
INSULATOR TESTER UNIT
John A, Farquhar, and Merrilyn J. Farquhar, both of 448 West 18th Avenue, Vancouver, B.C., Canada
Filed Oct. 15, 1985, Ser. No. 787,489
Term of patent 14 years
U.S. Cl. D10—75



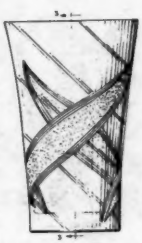
299,440
BARRICADE WARNING LIGHT TESTING DEVICE
Thomas W. Barker, 79 Pecan Valley Clr., San Antonio, Tex. 78223
Filed Apr. 28, 1986, Ser. No. 858,229
Term of patent 14 years
U.S. Cl. D10—77

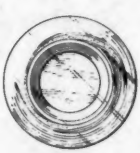


299,441
PLANT POT AND BASE COMBINATION
James E. McAlpine, Glasgow, Scotland, assignor to McAlpine & Company Limited, Glasgow, Scotland
Filed Sep. 2, 1986, Ser. No. 903,076
Term of patent 14 years
U.S. Cl. D11—152

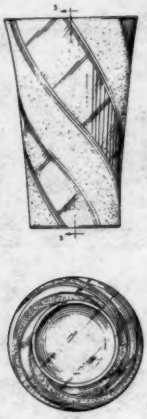


299,442
VASE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Apr. 24, 1987, Ser. No. 41,924
Term of patent 14 years
U.S. Cl. D11—153





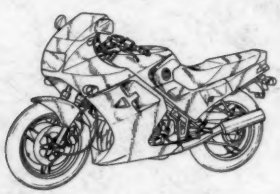
299,443
VASE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Apr. 24, 1987, Ser. No. 41,925
Term of patent 14 years
U.S. Cl. D11—153



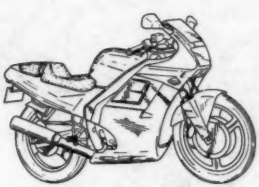
299,444
VASE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Apr. 30, 1987, Ser. No. 44,118
Term of patent 14 years
U.S. Cl. D11—153

299,445
VASE OR SIMILAR ARTICLE
Chung S. Lee, Sanchung, Taiwan, assignor to Three-Ply Company, Ltd., Taiwan
Filed Nov. 9, 1987, Ser. No. 118,809
Term of patent 14 years
U.S. Cl. D11—153

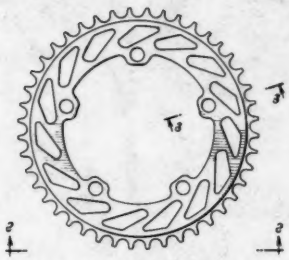
299,446
MOTORCYCLE
Mitsuyoshi Kohama; Toshiaki Kishi, and Nobuyuki Kyogoku, all of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 7, 1986, Ser. No. 842,011
Claims priority, application Japan, Sep. 9, 1985, 60-38032
Term of patent 14 years
U.S. Cl. D12—110



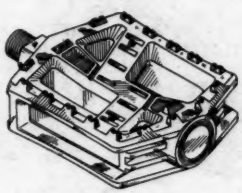
299,447
MOTORCYCLE
Tsutomu Sakuma, Saitama; Toshiaki Kishi, Tokyo; Tamotsu Miura, Kanagawa, and Takeshi Ooba, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 5, 1986, Ser. No. 904,253
Claims priority, application Japan, Mar. 5, 1986, 61-7749
Term of patent 14 years
U.S. Cl. D12—110



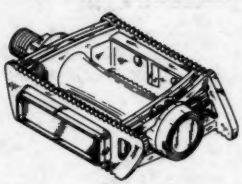
299,448
SPROCKET
Robert B. Haro, 730 Bonita Rd., Encinitas, Calif. 92024
Filed May 16, 1986, Ser. No. 864,130
Term of patent 14 years
U.S. Cl. D12—123



299,449
BICYCLE PEDAL
Yoshiya Chounan, Souka, Japan, assignor to Sakae Ringyo Co., Ltd., Japan
Filed Mar. 6, 1986, Ser. No. 837,361
Term of patent 14 years
U.S. Cl. D12—125

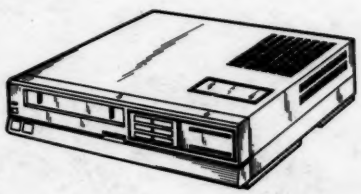


299,450
BICYCLE PEDAL
Yoshiya Chounan, Souka, Japan, assignor to Sakae Ringyo Co., Ltd., Japan
Filed Mar. 6, 1986, Ser. No. 837,362
Term of patent 14 years
U.S. Cl. D12—125

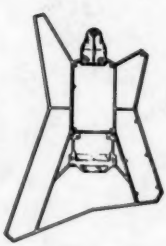


299,451
SPEECH SYNTHESIZER ACTIVATED BY READING OF A MAGNETIC CARD
Tameaki Ikeda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 22, 1985, Ser. No. 768,328
Claims priority, application Japan, Feb. 27, 1985, 60-7500
Term of patent 14 years
U.S. Cl. D14—158

299,452
VIDEO CASSETTE RECORDER
Doo S. Yang, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 9, 1986, Ser. No. 872,469
Claims priority, application Rep. of Korea, Dec. 10, 1985, 17460/1985
Term of patent 14 years
U.S. Cl. D14—135



299,453
GUITAR BODY
James W. Brunet, 215 Vann St., Syracuse, N.Y. 13206
Filed May 13, 1985, Ser. No. 733,325
Term of patent 14 years
U.S. Cl. D17—20



299,454

HEADSET

Ng H. Kwong, Flat "Q", 8th Floor, Hopewell House, 175 Hip Wo Street, Kwun Tong, Kowloon, Hong Kong

Filed Sep. 10, 1985, Ser. No. 774,533

Claims priority, application United Kingdom, Mar. 18, 1985, 1025600

Term of patent 14 years

U.S. Cl. D14—205

299,455

TELECOMMUNICATIONS HOUSING

Floyd J. Pushelberg, Ottawa, Canada, and James A. Rintala, Livonia, Mich., assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 27, 1985, Ser. No. 716,494

Claims priority, application Canada, Dec. 21, 1984, 21-12-84-3

Term of patent 14 years

U.S. Cl. D14—240

299,456

TELEPHONE SET

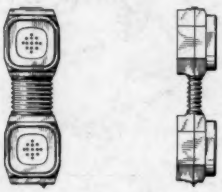
Pei Wen Kuo, 17-21 Bowhong Rd., Hsin Tien, Taiwan

Filed Apr. 17, 1987, Ser. No. 39,364

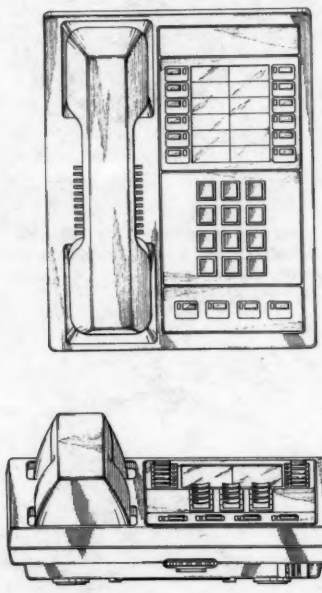
Term of patent 14 years

U.S. Cl. D14—151

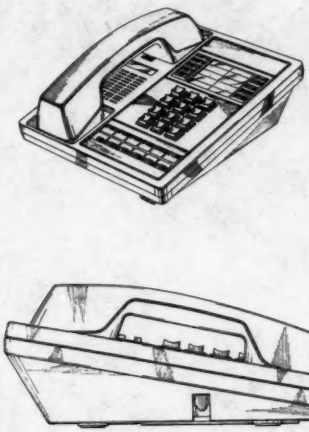
299,457
ACOUSTIC COUPLER FOR TRANSMITTING DATA BY WAY OF A TELEPHONE
Bernd D. Behnk, Berlin, Fed. Rep. of Germany, assignor to Coscom Datentechnik GmbH & Co. Computer KG, Berlin, Fed. Rep. of Germany
Filed Apr. 30, 1985, Ser. No. 728,926
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1984, 95-MR-5367/NZ
Term of patent 14 years
U.S. Cl. D14—242



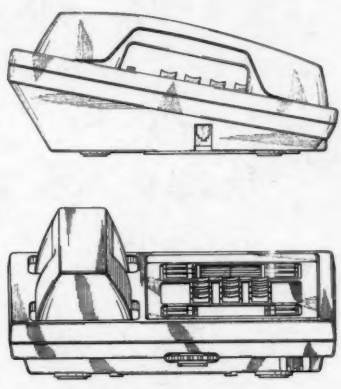
299,458
TELEPHONE SET
Joseph G. Aschauer, Newtown, and John Cuccio, Westport, both of Conn., assignors to TIE Communications, Inc., Shelton, Conn.
Filed Oct. 14, 1987, Ser. No. 108,573
Term of patent 14 years
U.S. Cl. D14—151



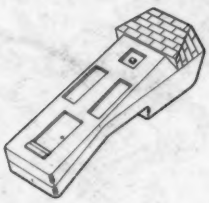
299,459
TELEPHONE SET
Joseph G. Aschauer, Newtown, and John Cuccio, Westport, both of Conn., assignors to TIE Communications, Inc., Shelton, Conn.
Filed Oct. 14, 1987, Ser. No. 108,574
Term of patent 14 years
U.S. Cl. D14—151



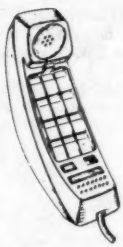
299,460
TELEPHONE SET
Joseph G. Aschauer, Newtown, and John Cuccio, Westport, both of Conn., assignors to TIE Communications, Inc., Shelton, Conn.
Filed Oct. 14, 1987, Ser. No. 108,575
Term of patent 14 years
U.S. Cl. D14—151



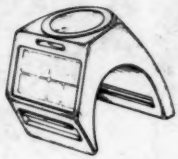
299,461
HOUSING FOR A HANDSET TELEPHONE
Ruth Blewitt, 172 Conlins Road, Scarborough, Ontario, Canada (M1C 1C5)
Filed Jun. 2, 1987, Ser. No. 56,676
Term of patent 14 years
U.S. Cl. D14—248



299,462
HANDSET TELEPHONE
Jack J. Sullivan, Danbury; Barry M. Haber, Westport, and James E. Butler, Bridgeport, all of Conn., assignors to Conair Corporation, Edison, N.J.
Filed Jul. 20, 1987, Ser. No. 75,322
Term of patent 14 years
U.S. Cl. D14—147

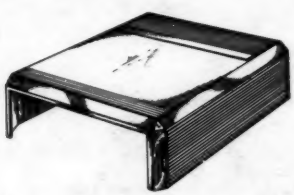


299,463
WRIST COMPUTER FOR DIVERS
Jurgen Hermann, Mauren, Liechtenstein, assignor to Divetronic AG, Mauren, Liechtenstein
Filed Feb. 10, 1986, Ser. No. 827,551
Claims priority, application World Int. Prop. O., Aug. 21, 1985, 005,722
Term of patent 14 years
U.S. Cl. D14—100

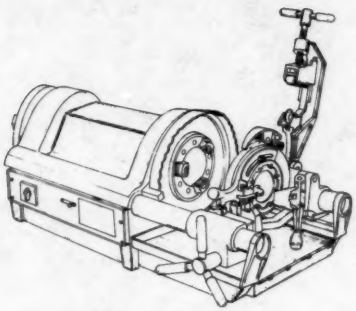


299,464
POCKET COMPUTER
Hajime Shiozawa; Kazumi Osaka, and Ken Kimata, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan
Filed May 23, 1986, Ser. No. 867,733
Claims priority, application Japan, Nov. 28, 1985, 60-49862
Term of patent 14 years
U.S. Cl. D14—100

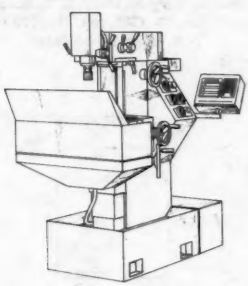
299,465
HOUSING FOR COMPUTER EQUIPMENT
Edmond J. Helstab, Ottawa, Canada, assignor to Northern Telecom Limited, Quebec, Canada
Filed Sep. 23, 1985, Ser. No. 779,362
Term of patent 14 years
U.S. Cl. D14—114



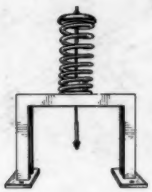
299,466
POWER DRIVEN THREADING MACHINE
Robert J. Hayes, Westlake, and James C. Redman, Amherst, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.
Filed Aug. 7, 1985, Ser. No. 763,203
Term of patent 14 years
U.S. Cl. D15—130



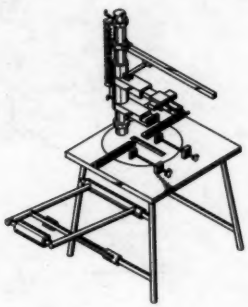
299,467
UNIVERSAL MILLING MACHINE
Josef Ritt, Oesterreich, Austria, assignor to Maier & Co., Austria
Filed Jul. 1, 1986, Ser. No. 881,016
Claims priority, application Austria, Feb. 20, 1986, 17633
Term of patent 14 years
U.S. Cl. D15—131



299,468
SHOCK ABSORBER
Jyrki Ronkainen, Helsinki, Finland, assignor to Temet Oy, Helsinki, Finland
Filed Oct. 28, 1985, Ser. No. 792,125
Claims priority, application Finland, Apr. 26, 1985, 324/85
Term of patent 14 years
U.S. Cl. D15—141



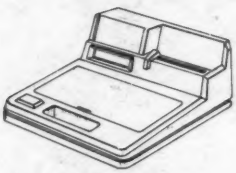
299,469
FRAME FOR COMBINATION GRINDER AND SAW
Mark Schneider, and Theresa Schneider, both of 134 S. 8th St., Wakeney, Kans. 67672
Filed Jul. 8, 1986, Ser. No. 883,513
Term of patent 14 years
U.S. Cl. D15—141



299,470
MARKING INSTRUMENT
Gerhard Möck, Kirchehrenbach, Fed. Rep. of Germany, assignor to Schwan-Stabilo Schwanhausser GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Nov. 8, 1985, Ser. No. 803,947
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, MR VII 213
Term of patent 14 years
U.S. Cl. D19—43

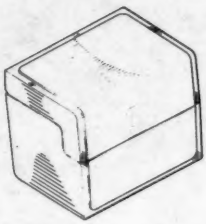
299,471
FRISKET PEN
Leon Carver, and Ollis Carver, Sr., both of 5550 S. Dorchester St., Chicago, Ill. 60637
Filed Sep. 20, 1985, Ser. No. 778,429
Term of patent 14 years
U.S. Cl. D19—49

299,472
EDUCATIONAL TOY VIEWING DEVICE
Raymond C. Phinney, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 15, 1986, Ser. No. 919,309
Term of patent 14 years
U.S. Cl. D19—60



299,473
EDUCATIONAL TOY VIEWING DEVICE
Patrick J. Murphy, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 17, 1986, Ser. No. 920,870
Term of patent 14 years
U.S. Cl. D19—60

299,474
CARD FILE
Gerald J. Klodt, Madison, Wis., assignor to W. T. Rogers Company, Madison, Wis.
Filed Oct. 1, 1985, Ser. No. 782,363
Term of patent 14 years
U.S. Cl. D19—76



299,475
COMBINED GOLF CARD HOLDER AND INSERT THEREFOR
John H. G. Munnik, Margate, Natal 4275, South Africa
Filed Dec. 18, 1985, Ser. No. 810,250
Term of patent 14 years
U.S. Cl. D19—78

299,476

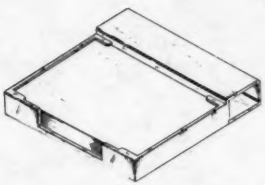
COMBINED PEN/PENCIL AND MEMO PAD HOLDER

Stephen H. Wolff, 222 E. 35th St., New York, N.Y. 10016

Filed Dec. 20, 1985, Ser. No. 811,381

Term of patent 14 years

U.S. Cl. D19—78



299,477

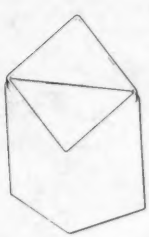
PENCIL CUP OR THE LIKE

Gerald J. Klodt, Madison, Wis., assignor to W. T. Rogers Company, Madison, Wis.

Filed Sep. 30, 1985, Ser. No. 782,528

Term of patent 14 years

U.S. Cl. D19—85



299,478

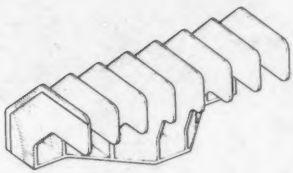
VERTICAL MESSAGE FILE OR THE LIKE

Gerald J. Klodt, Madison, Wis., assignor to W. T. Rogers Company, Madison, Wis.

Filed Oct. 1, 1985, Ser. No. 782,375

Term of patent 14 years

U.S. Cl. D19—90



299,479

ARROWHEAD PULLER

Jim M. Richardson, P.O. Box 393, Playas, N. Mex. 88009

Filed Feb. 14, 1986, Ser. No. 834,032

Term of patent 14 years

U.S. Cl. D22—199

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JANUARY, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
Roberts, Gerald B., 4,798,922, Cl. 200-400.000.

A.N.F. Industrie: *See*—
Girard, Jean-Michel, 4,798,148, Cl. 105-17.000.

A/S Platon: *See*—
Hallberg, Carl R., 4,798,498, Cl. 405-258.000.

A/S Sonnichsen Rorvalseverket: *See*—
Boen Per, 4,798,696, Cl. 264-209.200.

AB Tetra Pak: *See*—
Lagerstedt, Jan; and Martensson, Kjell, 4,798,296, Cl. 206-631.200.
Rausing, Hans, 4,798,295, Cl. 206-621.600.

Abe, Akira: *See*—
Kishimoto, Shinzo; Nishikawa, Toshihiro; Abe, Akira; and Nakajima, Junya, 4,798,784, Cl. 430-382.000.

Abe, Kenji: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; and Hosono, Yoichi, 4,798,781, Cl. 430-270.000.

Abe, Kumiko: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,798,728, Cl. 426-129.000.

Abe, Noriyuki: *See*—
Sakagami, Atsushi; Futami, Toru; Abe, Noriyuki; and Suzuki, Tadashi, 4,799,218, Cl. 370-85.000.

Abou-Gharbia, Magid A.; Yardley, John P.; and Tio, Cesario O., to American Home Products Corporation. Antipsychotic gamma-carboline N-oxides. 4,798,896, Cl. 546-87.000.

Abraham, Dennis G.; Double, Glen P.; and Neckyfarow, Steven W., to International Business Machines Corporation. Secure component authentication system. 4,799,061, Cl. 340-825.340.

Abuaf, Nesim; Barito, Robert W.; and Downs, Kenneth L., to General Electric Company. Insulating panels containing insulating powders and insulating gases. 4,798,753, Cl. 428-69.000.

Achterwinter, Norbert: *See*—
Halter, Hartmut; Zimmermann, Paul H.; and Achterwinter, Norbert, 4,798,351, Cl. 242-65.000.

Ackeret, Peter, to Licinvest AG. Container for a pile of pictures. 4,798,015, Cl. 40-152.100.

Ackermann, Peter: *See*—
Guell, Laurenz; and Ackermann, Peter, 4,798,912, Cl. 568-637.000.

Ackermann, Ulrich, to BBC Brown Boveri & Co., Ltd. Compressed-gas breaker. 4,798,924, Cl. 200-148.00R.

Ackerson, Robert C.; and Yuyama, Takeshi, to Du Pont de Nemours, E. I., and Company. Selective method-of-use of oxabicycloalkanes. 4,798,621, Cl. 71-90.000.

Acme Electric Corporation: *See*—
Emerson, Wayne C., 4,799,130, Cl. 361-437.000.

Acosta, Jorge L.: *See*—
Hellekson, Ronald A.; Acosta, Jorge L.; and Campbell, John S., 4,799,164, Cl. 235-467.000.

Acushnet Company: *See*—
Berard, Raymond A., 4,798,386, Cl. 273-235.00R.

Adachi, Shoji: *See*—
Hosoda, Takuya; Adachi, Shoji; and Kudo, Atsushi, 4,798,950, Cl. 250-214.00A.

Adeka Argus Chemical Co., Ltd.: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Hirai, Bunji; and Sugibuchi, Kazuo, 4,798,836, Cl. 524-89.000.

Adolph Coors Company: *See*—
Dugan, Larry M., 4,798,234, Cl. 141-165.000.

Adolph, Manfred, to Lindermann Maschinenfabrik GmbH. Hammer breaker. 4,798,345, Cl. 241-186.200.

Advantest Corporation: *See*—
Kannari, Shigeru, 4,799,008, Cl. 324-73.00R.

Aerospatiale Societe Nationale Industrielle: *See*—
Bouteyre, Jacques; and Le Floc'H, Christian, 4,798,466, Cl. 356-347.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Zangenfeind, Helmut; Domges, Gunther; and Wurfel, Reinhart, 4,799,076, Cl. 354-308.000.

Agro-Kanesho Co., Ltd.: *See*—
Someya, Shinzo; Akahira, Rokuro; Horino, Hiroshi; Ohnaka, Michihiro; and Kiuchi, Takashi, 4,798,618, Cl. 71-92.000.

Aho, Kenneth A.; Melby, Jeffrey J.; and Miller, Richard A., to Minnesota Mining and Manufacturing Company. Automotive lighting element. 4,799,131, Cl. 362-61.000.

Aho, Kenneth A., to Minnesota Mining and Manufacturing Company. Reflective film. 4,799,137, Cl. 362-309.000.

Aillon, Rene. Central venous pressure catheter and method for using. 4,798,588, Cl. 604-122.000.

Air Plus, Inc.: *See*—
Goode, Barry L., 4,797,962, Cl. 5-453.000.

Air Products and Chemicals, Inc.: *See*—
Lai, Ta-Wang; and Vijayendran, Bheema R., 4,798,871, Cl. 525-328.200.

Aisan Kogyo Kabushiki Kaisha: *See*—
Ito, Shoji; and Minoura, Mikio, 4,798,188, Cl. 123-478.000.

Aisen Seiki Kabushiki Kaisha: *See*—
Tanino, Masaharu; and Hattori, Takemi, 4,798,415, Cl. 297-410.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Naito, Hiroshi, 4,798,253, Cl. 180-79.100.
Okabe, Yoshio; Arai, Fumio; and Kodama, Hisashi, 4,798,180, Cl. 123-90.580.
Okabe, Yoshio; Kobayashi, Yukimori; Ishikawa, Makoto; Kamiya, Tamotsu; and Atsumi, Tomiaki, 4,798,563, Cl. 474-110.000.

Aisin Seiki Kabushiki Kaisha Co., Ltd.: *See*—
Kito, Masahiro; Mori, Katsuhiro; and Mitsumoto, Takashi, 4,798,242, Cl. 165-103.000.

Ajinomoto General Foods, Inc.: *See*—
Osawa, Hide, 4,798,732, Cl. 426-542.000.

Ajisawa, Akira: *See*—
Fujiwara, Masahiko; Ajisawa, Akira; and Suzuki, Shuji, 4,798,435, Cl. 350-96.130.

Akahira, Rokuro: *See*—
Someya, Shinzo; Akahira, Rokuro; Horino, Hiroshi; Ohnaka, Michihiro; and Kiuchi, Takashi, 4,798,618, Cl. 71-92.000.

Akama, Hiroshi: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; Matsuda, Toshiaki; Ito, Meiji; Kamiguchi, Taiji; Teshima, Nobue; and Akama, Hiroshi, 4,798,813, Cl. 502-60.000.

Akao, Michitoshi: *See*—
Onoda, Hiroshi; Sakakibara, Kenji; and Akao, Michitoshi, 4,798,485, Cl. 400-54.000.

Akhawala, Mohammed I.: *See*—
Warthen, William P.; and Akhawala, Mohammed I., 4,798,200, Cl. 128-89.00R.

Akimoto, Taizo; Akisada, Masahide; Seiki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, to Fuji Photo Film Co., Ltd. Separate-exposure photographing apparatus. 4,799,072, Cl. 354-76.000.

Akisada, Masahide: *See*—
Akimoto, Taizo; Akisada, Masahide; Seiki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,799,072, Cl. 354-76.000.

Aktiebolaget Bofors: *See*—
Svanstrom, Rune, 4,798,123, Cl. 89-34.000.

Akutsu, Eiichi: *See*—
Saito, Koichi; Akutsu, Eiichi; Fujimura, Yoshihiko; and Inoue, Nanao, 4,799,068, Cl. 346-1.100.

Akzo America Inc.: *See*—
Parr, William J., 4,798,860, Cl. 524-409.000.

Al Tech Specialty Steel Corporation: *See*—
McCune, Harry E., III; and Divine, Charles A., Jr., 4,798,634, Cl. 148-325.000.

Albarda, Scato: *See*—
Heim, Ulrich; and Albarda, Scato, 4,798,689, Cl. 261-39.100.

Alcatel USA, Corp.: *See*—
Parruck, Bidyut; and Mulla, Hoshang D., 4,799,144, Cl. 364-200.000.

Alderfer, Earl L. Coupling kit. 4,798,569, Cl. 474-255.000.

Alderman, Arnold N.: *See*—
Balcom, James E.; Kozek, Edward P.; and Alderman, Arnold N., 4,799,039, Cl. 340-333.000.

Alderson, David L.: *See*—
Foster, Thomas V.; Jones, Stanley P.; and Alderson, David L., 4,798,617, Cl. 65-25.100.

Alexander, George F.; Coutant, Alan R.; Fee, David M.; and Riediger, Craig W., to Caterpillar Inc. Control mechanism for operating a vehicle. 4,798,099, Cl. 74-473.00R.

Alf. Hannaford & Co. Pty. Ltd.: *See*—
Hornhardt, Hubert L.; and Nuske, Geoffrey G., 4,798,280, Cl. 198-666.000.

Alfa-Laval Agri, Inc.: *See*—
Townsend, Ted H.; Moore, Clinton L.; and Machnicki, John T., 4,798,175, Cl. 119-155.000.

Alfred Teves GmbH: *See*—
Becker, Horst P., 4,798,422, Cl. 303-115.000.

All Packaging Machinery & Supplies Corp.: *See*—
Litt, Irving L., 4,798,038, Cl. 53-372.000.

Allen Engineering Corporation: *See*—
Allen, J. Dewayne, 4,798,494, Cl. 404-114.000.

Allen, Ioan R.: *See*—
Mandell, Douglas E.; Todd, Craig C.; Allen, Ioan R.; and Davis, Mark F., 4,799,260, Cl. 381-22.000.

Allen, J. Dewayne, to Allen Engineering Corporation. Floating vibrational screed. 4,798,494, Cl. 404-114.000.

Allen, Max D.: *See*—
Coates, Donald A.; Manthei, Philip J.; and Allen, Max D., 4,798,424, Cl. 312-257.00R.

Allen, Philip C., to British Petroleum Company p.l.c., The. Poly(acetylene) films having localized zones of a low conductivity material. 4,798,782, Cl. 430-270.000.

Allied Colloids Limited: *See*—
Johnson, Ian M.; Moody, Ian M.; and Flesher, Peter, 4,798,861, Cl. 524-458.000.
Symes, Kenneth C.; and Flesher, Peter, 4,798,888, Cl. 536-123.000.

Allied-Signal Inc.: *See*—
Chilluffo, Ronald L.; and Gottlieb, Ellis J., 4,799,035, Cl. 333-223.000.
Fang, Ho T., 4,798,320, Cl. 228-122.000.
Glaser, Jerry; and Elpern, David G., 4,798,523, Cl. 417-407.000.
McAfee, David D., 4,798,052, Cl. 60-572.000.

Alonso, Frank, to Spectra Star Kites. Flexible frame fastening system for kites. 4,798,356, Cl. 244-153.00R.

Alphabet, Inc.: *See*—
Mayhew, John, 4,798,365, Cl. 251-205.000.

Alps Electric Co., Ltd.: *See*—
Igarashi, Sadao; and Ueno, Moriaki, 4,799,033, Cl. 333-134.000.

Alter, Sheldon. Beverage caddy apparatus. 4,798,360, Cl. 248-311.200.

Alternative Energy Resources, Inc.: *See*—
Haws, Spencer K., 4,798,224, Cl. 137-337.000.

Amakasu, Toshinari: *See*—
Fukuta, Shigemi; Amakasu, Toshinari; Ugata, Ken; and Yoshino, Shoichi, 4,798,615, Cl. 65-4.400.

Amano, Michiaki: *See*—
Matsuishi, Naoto; Nakagawa, Yoshio; Amano, Michiaki; Kakehi, Norihiko; Kawashima, Toshio; and Omura, Shigeki, 4,798,832, Cl. 514-258.000.

Amazonen Werke, H. Dreyer GmbH. Co. KG: *See*—
Gattermann, Bernd; Steenken, Bernhard; Grosse-Scharmann, Franz; and Muller, Horst, 4,798,271, Cl. 192-18.00R.

Amdahl Corporation: *See*—
Wilson, J. Chris; and Shah, Arun, 4,799,155, Cl. 364-200.000.

American Cyanamid Co.: *See*—
Los, Marinus, 4,798,619, Cl. 71-66.000.

American Geodesics, Inc.: *See*—
Rose, Benjamin L., Jr., 4,798,032, Cl. 52-81.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A.; Yardley, John P.; and Tio, Cesario O., 4,798,896, Cl. 546-87.000.

American Maize-Products Company: *See*—
Friedman, Robert B.; Gottneid, David J.; Faron, Eugene J.; Pustek, Frank J.; and Katz, Frances R., 4,798,735, Cl. 426-578.000.

American Science and Engineering, Inc.: *See*—
Annis, Martin; and Bjorkholm, Paul J., 4,799,247, Cl. 378-87.000.

American Telephone and Telegraph Company: *See*—
Bernstein, Howard L.; Grill, Thomas M.; and Silver, Ronald, 4,798,322, Cl. 235-487.000.
Murr, Michael R.; Rajasekera, Jay R.; and Vrieland, Bruce C., 4,798,641, Cl. 156-158.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Barwick, Morris L.; and Praught, Ronald B., 4,798,923, Cl. 200-50.00R.
Fang, Rong-Chin, 4,799,217, Cl. 370-68.100.

American Telephone and Telegraph Company - AT&T Information Systems: *See*—
Billinger, Randy J.; Dotter, Laurel K.; and Gasaway, Tommy D., 4,799,255, Cl. 379-189.000.

American Telephone and Telegraph Company - AT&T Technologies, Inc.: *See*—
Myers, Daryl L.; and Wright, James G., Jr., 4,798,346, Cl. 242-18.00A.

American Thermocraft Corp.: *See*—
Katz, Sigmund, 4,798,536, Cl. 433-212.100.

Ameseder, Antos, to Starrfraasmaschinen AG. Process and apparatus for removal of dust and chip material at the machining station of a machine tool. 4,798,505, Cl. 409-136.000.

Amishima, Shigeaki, to Aso Pharmaceutical Co., Ltd. Magnetic therapeutic device. 4,798,194, Cl. 128-9.000.

Amoco Corporation: *See*—
Evans, April J., 4,798,825, Cl. 514-65.000.
Palm, John W., 4,798,716, Cl. 423-574.00R.

AMP Incorporated: *See*—
Asick, John C.; Landis, John M.; and Yingst, Stephen M., 4,798,542, Cl. 439-188.000.
Hoffer, John C.; and Schaffer, Ronald R., 4,798,440, Cl. 350-96.200.
Masters, Timothy E.; and Wehrer, Wayne J., 4,799,044, Cl. 341-5.000.

Anders, Robert J.; Cerveny, John G.; and Milkowski, Andrew L., to Oscar Mayer Foods Corporation. Method for delaying *Clostridium botulinum* growth in fish and poultry. 4,798,729, Cl. 426-326.000.

Anderson, David M.; and McGuire, Jeffrey C., to Genex Corporation. Vector for high level gene expression. 4,798,791, Cl. 435-68.000.

Andersson, Ingvar; and Wadstein, Jan. Injection device. 4,798,595, Cl. 604-174.000.

Ando Electric Co., Ltd.: *See*—
Hosoda, Takuya; Adachi, Shoji; and Kudo, Atsushi, 4,798,950, Cl. 250-214.00A.

Ando, Masanori: *See*—
Ichigaya, Hiroshi; Tagawa, Susumu; Sugii, Yasuoshi; Ando, Masanori; Yamazaki, Jun; Kawada, Yasuo; Kinoshita, Tokuho; Shirahama, Toshio; Ito, Yoshinori; and Munemoto, Eiji, 4,798,992, Cl. 313-406.000.

Annis, Martin; and Bjorkholm, Paul J., to American Science and Engineering, Inc. X-ray imaging particularly adapted for low Z materials. 4,799,247, Cl. 378-87.000.

Annovi, Giuseppe, to Dolomite S.p.A. Ski-boot heater. 4,798,933, Cl. 219-211.000.

Ansmann, Achim, to Henkel Kommanditgesellschaft auf Aktien. Oil-in-water emulsions with increased viscosity under shear stress. 4,798,682, Cl. 252-312.000.

ANT Nachrichtentechnik GmbH: *See*—
Feilhauer, Helmut; and Steimle, Josef, 4,798,442, Cl. 350-96.210.

Aoki, Tokuei; Kudo, Junichiro; and Kohno, Katsumi, to Sony Corporation. Optical information record medium. 4,798,767, Cl. 428-412.000.

Apholt, Horst, to Hoesch Aktiengesellschaft. Hollow charge shell constructed as drill ammunition. 4,798,144, Cl. 102-445.000.

Appareils Iona Inc.: *See*—
Hetherington, Michael W.; Garner, David P.; and Millman, Allan D., 4,798,613, Cl. 55-52.000.

Applied Automation, Inc.: *See*—
Layton, James E., 4,799,041, Cl. 341-120.000.

Aquarian Accessories Corporation: *See*—
Donohoe, David G., 4,798,121, Cl. 84-414.000.

Arai, Fumio: *See*—
Okabe, Yoshio; Arai, Fumio; and Kodama, Hisashi, 4,798,180, Cl. 123-90.580.

Arai, Haruo: *See*—
Kanazawa, Yasunori; Arai, Haruo; and Kuwa, Tadahiro, 4,799,123, Cl. 360-133.000.

Arai, Ken-ichi: *See*—
Lee, Frank D.; Yokota, Takashi; and Arai, Ken-ichi, 4,798,789, Cl. 435-68.000.

Arakawa, Hideki, to Fujitsu Limited. Semiconductor random access nonvolatile memory device with restore and control circuits. 4,799,194, Cl. 365-154.000.

Arana, Thomas. Biopsy paddle with adjustable locator plate. 4,798,212, Cl. 128-749.000.

Arbeille, Yves; Drutel, Yves; and Viguier, Alain, to Renault Agriculture. Clutch automation device. 4,799,160, Cl. 364-424.100.

Arch, Paul E.; and Niemann, Edwin H., to Arco Chemical Company. Isopentane as blowing agent to improve coffee retention in foam cups molded from expandable polystrene. 4,798,749, Cl. 428-36.500.

Architectural Wall Systems, Inc.: *See*—
Mitchell, Terry L.; and Spoolstra, Lawrence J., 4,798,035, Cl. 52-281.000.

Arco Chemical Company: *See*—
Arch, Paul E.; and Niemann, Edwin H., 4,798,749, Cl. 428-36.500.
Lordi, Frank E.; and Vanderpool, Peter J., 4,798,868, Cl. 525-207.000.

Argentini, Dino E., to Raytheon Company. Self-aligning bonding technique. 4,798,643, Cl. 156-295.000.

Arizmendi, Napoleon: *See*—
Curington, Alfred R.; and Arizmendi, Napoleon, 4,798,243, Cl. 166-65.100.

Armstrong, William J.; and Stich, Richard A., to General Electric Company. Compartment assembly for a refrigerator. 4,798,425, Cl. 312-328.000.

Armstrong World Industries, Inc.: *See*—
Hemphill, J. Marshall; and Hoffer, Roy D., 4,798,998, Cl. 315-297.000.

Arnheim, Norman: *See*—
McCormick, Francis P.; Wong, Gail L.; Clark, Robin; Arnheim, Norman; and Nitecki, Danute E., 4,798,787, Cl. 435-7.000.

Arnold, Donald L., to Chesebrough-Pond's Inc. Continuous thread closure assembly. 4,798,303, Cl. 215-329.000.

Arnold, George R. Convection lock-vent. 4,798,327, Cl. 237-50.000.

Aronsson, Jan U., to Hegri, B.V. Method of producing brick-like facing elements. 4,798,117, Cl. 83-870.000.

Arthur, James D.: *See*—
Sanderford, H. Britton, Jr.; Rouquette, Robert E.; and Arthur, James D., 4,799,062, Cl. 342-450.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hidaka, Hiroyoshi; and Morikawa, Anri, 4,798,897, Cl. 546-139.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Inoue, Masahide; Ichitsuka, Takeshi; Hirayama, Yasuhiko; Koshikawa, Shozo; Kitaoka, Tateki; Nakabayashi, Nobuo; Takeda, Tatsumichi; and Minoo, Osamu, 4,798,585, Cl. 604-93.000.

Asano, Masamichi: *See*—
Iwahashi, Hiroshi; and Asano, Masamichi, 4,799,195, Cl. 365-185.000.

Asano, Seiji; and Tanaka, Yasuhiko, to Fuji Photo Film Co., Ltd. Lens shifting mechanism. 4,799,073, Cl. 354-195.120.

Asano, Yasushi: *See*—
Mochida, Haruo; and Asano, Yasushi, 4,798,160, Cl. 116-28.100.

Ashland Oil, Inc.: *See*—
Goel, Anil B.; and Chang, Biau-Hung, 4,798,872, Cl. 558-186.000.
Goel, Anil B., 4,798,881, Cl. 528-73.000.

Asick, John C.; Landis, John M.; and Yingst, Stephen M., to AMP Incorporated. Switching connector. 4,798,542, Cl. 439-188.000.

Asics Corporation: *See*—
Sugiyama, Yasunori, 4,798,010, Cl. 36-30.00R.

Aso Pharmaceutical Co., Ltd.: *See*—
Amishima, Shigeaki, 4,798,194, Cl. 128-9.000.
Assard, Gerald L., to United States of America, Navy. Complementary interferometric hydrophone. 4,799,202, Cl. 367-149.000.
Asten Group, Inc.: *See*—
Diaz-Kotti, Michelle A., 4,798,760, Cl. 428-234.000.
Astley, Graham J.: *See*—
Belanger, James A.; Wentworth, Robert J.; Turner, Barry S.; and Astley, Graham J., 4,798,008, Cl. 34-243.00C.
Astra Lakemedel Aktiebolag: *See*—
Johnsson, Karl N.; Lindborg, Bjorn G.; and Noren, Jan-Olof, 4,798,833, Cl. 514-262.000.
Astronautics Corporation of America: *See*—
Malcolm, Richard E.; and Neuperger, Frank, 4,798,426, Cl. 350-3.700.
AT&T Bell Laboratories: *See*—
Bernstein, Howard L.; Grill, Thomas M.; and Silver, Ronald, 4,798,322, Cl. 235-487.000.
AT&T Information Systems Inc.: *See*—
Bernstein, Howard L.; Grill, Thomas M.; and Silver, Ronald, 4,798,322, Cl. 235-487.000.
Atlantic Richfield Company: *See*—
Berman, Elliot, 4,798,808, Cl. 437-4.000.
Ermer, James H.; and Love, Robert B., 4,798,660, Cl. 204-192.170.
Atochem: *See*—
Clerc-Renaud, Jacques; Leroux, Francis; and Ravier, Dominique, 4,798,662, Cl. 204-290.00R.
Atsumi, Tomiaki: *See*—
Okabe, Yoshio; Kobayashi, Yukimori; Ishikawa, Makoto; Kamiya, Tamotsu; and Atsumi, Tomiaki, 4,798,563, Cl. 474-110.000.
Aubrey, Kenneth R., to Cubic Western Data. Easy access ticket transport mechanism. 4,798,942, Cl. 235-384.000.
Aubry, Nestor; Couder, Armand; and Weverbergh, Andre, to Messer Griesheim GmbH. Process and device for cooling. 4,798,614, Cl. 62-374.000.
Auerbach, Dieter: *See*—
Bauch, Helmut; Kleber, Wolfgang; and Auerbach, Dieter, 4,798,338, Cl. 239-692.000.
Augat Inc.: *See*—
Strohschneider, Heinz F., deceased, 4,799,006, Cl. 324-158.00F.
Augustsson, Nils-Erik. Device for radiation field shielding in radiotherapy. 4,798,961, Cl. 250-515.100.
Auracher, Franz: *See*—
Haeussler, Klaus M.; Wittmann, Julius; Gaukel, Gisela; and Auracher, Franz, 4,799,234, Cl. 372-97.000.
Ausimont S.p.A.: *See*—
Visca, Mario; Boero, Giancarlo; and Lenti, Daria, 4,798,854, Cl. 523-334.000.
Australia Nuclear Science & Technology Organisation: *See*—
Ramm, Eric J., 4,798,524, Cl. 425-77.000.
Avdel Limited, a British Company: *See*—
Miles, Michael; and Tarling, Stephen R., 4,798,079, Cl. 72-391.000.
Averill, Robert G.; and Khowaylo, Alex, to Osteonics Corp. Prosthetic implant device. 4,798,610, Cl. 623-22.000.
Avila, Harold C. Image position control. 4,799,049, Cl. 340-709.000.
Axonn Corporation: *See*—
Sanderford, H. Britton, Jr.; Rouquette, Robert E.; and Arthur, James D., 4,799,062, Cl. 342-450.000.
Ayad, Hafez M., to Rhone Poulenc Nederlands B.V. Synergistic insecticidal compositions. 4,798,839, Cl. 514-351.000.
Ayala, Jorge A.; Joyce, George A.; and Crabbe, David, to Columbian Chemicals Co. Pigment dispersion in resin. 4,798,856, Cl. 524-386.000.
Ayestaran, Luis C.: *See*—
Kucuk, Fikri; and Ayestaran, Luis C., 4,799,157, Cl. 364-422.000.
Azuma, Toshiro; and Hacegawa, Toshiyuki, to Kanzaki Kokyukoki Mfg. Co. Front wheel speed-up mechanism for a four wheel drive vehicle when turning. 4,798,259, Cl. 180-233.000.
B.F. Goodrich Company, The: *See*—
Hannah, Steven L.; Williams, Maureen R.; and Greenlee, Thomas W., 4,798,879, Cl. 528-45.000.
B., Strohschneider; Waltraud, legal representative: *See*—
Strohschneider, Heinz F., deceased, 4,799,006, Cl. 324-158.00F.
Babcock-Hitachi Kabushiki Kaisha: *See*—
Kato, Yasuyoshi; Koniahi, Kunihiko; Matsuda, Toshiaki; Ito, Meiji; Kamiguchi, Taiji; Teshima, Nobue; and Akama, Hiroshi, 4,798,813, Cl. 502-60.000.
Babcock Industries Inc.: *See*—
Baumgarten, John M., 4,798,100, Cl. 74-501.50R.
Babcock & Wilcox Company, The: *See*—
Colin, Joseph F.; Kaercher, Leo T.; and Roberts, Charles D., 4,798,368, Cl. 266-259.000.
Bachhofer, Bruno; and Locher, Anton. System for treating water with ozone. 4,798,669, Cl. 210-109.000.
Bagcraft Corporation of America: *See*—
Marnik, Ronald, 4,798,574, Cl. 493-267.000.
Baker, William X.; Bixler, Robert L., Jr.; Meddaugh, Michael D.; and Wright, Antony P., to Dow Corning Corporation. Catalyst composition and process for its preparation. 4,798,818, Cl. 502-228.000.
Baker Hughes Incorporated: *See*—
Curington, Alfred R.; and Arizmendi, Napoleon, 4,798,243, Cl. 166-65.100.
Balanced Energy Company: *See*—
Brunton, Ellis W.; Haynes, Denver J.; and Ross, William M., Jr., 4,798,737, Cl. 426-602.000.
Balazich, Gregory J.: *See*—
Roy, Dhirendra C.; Johnson, Roosevelt; and Balazich, Gregory J., 4,798,545, Cl. 439-677.000.
Balcom, James E.; Kozek, Edward P.; and Alderman, Arnold N., to Dual-Lite Manufacturing. Emergency lighting supervisory system. 4,799,039, Cl. 340-333.000.
Baliga, Bantval J., to General Electric Company. Metal oxide semiconductor gated turn off thyristor. 4,799,095, Cl. 357-38.000.
Ball, Richard L., to Johnson Industries, Inc. Furniture glide. 4,798,359, Cl. 248-188.300.
Ballard, Denis G. H.; Holmes, Paul A.; Nevin, Alan; Shirley, Ian M.; and Twose, David L., to Imperial Chemical Industries PLC. Polyaromatics. 4,798,742, Cl. 427-240.000.
Ballou, Byron T., to University of Pittsburgh. Method for selection of antigens suitable as in vivo targets for antibodies. 4,798,719, Cl. 424-1.100.
Bamberger, Hans: *See*—
Eylers, Dieter; and Bamberger, Hans, 4,797,982, Cl. 24-11.00R.
Bank, Howard M.: *See*—
Plueddemann, Edwin P.; and Bank, Howard M., 4,798,889, Cl. 556-401.000.
Bannell, John L. K.; Dixon, Arnold G.; and Davies, Trevor P., to Shell Oil Company. Apparatus for measuring dew-point of a gas stream with light scattering. 4,799,235, Cl. 374-18.000.
Banziger, Fritz A.; and Klein, Peter, to Dragerwerk AG. Speaking and hearing system for breathing apparatus. 4,799,263, Cl. 381-94.000.
Bardon, Dominique: *See*—
Vichon, Didier; Bardon, Dominique; and Encrenaz, Christian, 4,798,449, Cl. 350-358.000.
Barito, Robert W.: *See*—
Abuaf, Nesim; Barito, Robert W.; and Downs, Kenneth L., 4,798,753, Cl. 428-69.000.
Barlow, George J.; Keeley, James W.; and Nibby, Chester M., Jr., to Honeywell Bull Inc. Address transform method and apparatus for transferring addresses. 4,799,222, Cl. 371-51.000.
Barmag AG: *See*—
Schippers, Heinz; and Gerhartz, Siegmar, 4,798,347, Cl. 242-18.00R.
Barnaby, Anthony B., to Rank Taylor Hobson Limited. Vibration isolation means. 4,798,006, Cl. 33-573.000.
Barnes, William E. Anti-jackniffing valve. 4,798,419, Cl. 303-7.000.
Barnett, Barry R. M.; and Ellis, David C., to TRW United-Carr Limited, Inc. Connectors for insert moulding in panels. 4,797,983, Cl. 24-289.000.
Barriere, Jean-Claude; Cotrel, Claude; and Paris, Jean-Marc, to Rhone-Poulenc Sante. Synergistin derivatives and pharmaceutical compositions which contain them. 4,798,827, Cl. 514-183.000.
Bartels, Craig R.: *See*—
Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., 4,798,674, Cl. 210-640.000.
Bartos, Josef A., to Respirator Research, Ltd. Portable emergency breathing apparatus. 4,798,203, Cl. 128-205.220.
Barwick, Morris L.; and Praught, Ronald B., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Latch/switch for securing a circuit modules into a housing with accompanying circuit switching. 4,798,923, Cl. 200-50.00R.
BASF Aktiengesellschaft: *See*—
Franck, Burchard; and Gosmann, Martin, 4,798,891, Cl. 540-472.000.
Krueger, Heinz; Lardon, Hartmut; and Patsch, Manfred, 4,798,887, Cl. 534-637.000.
Lausberg, Dietrich; Blinne, Gerd; Ittemann, Peter; Heinz, Gerhard; Seiler, Erhard; and Knoll, Manfred, 4,798,855, Cl. 523-435.000.
Lehmann, Hans D.; Kretzschmar, Rolf; and Hahn, Klaus-Juergen, 4,798,811, Cl. 514-159.000.
Werner, Frank; Streu, Joachim; and Mueller, Herbert, 4,798,851, Cl. 521-137.000.
Battelle-Institut E.V.: *See*—
Lierke, Ernst-Gunter; Grossbach, Rudolf; Heide, Wolfgang; Flogel, Karl; and Junger, Martin, 4,798,332, Cl. 239-102.200.
Bau, Hui: *See*—
Chang, Stanley S.; Jones, Robert E.; and Bau, Hui, 4,797,995, Cl. 29-825.000.
Bauch, Helmut; Kleber, Wolfgang; and Auerbach, Dieter, to VEB Infrarot-Anlagen Oranienburg. Apparatus for the electro-kinetic charging of powdered materials. 4,798,338, Cl. 239-692.000.
Baumgarten, John M., to Babcock Industries Inc. Automatic adjustment device for cable control systems. 4,798,100, Cl. 74-501.50R.
Baxter, Ivor R., to General Electric Company, p.l.c., The. Focusing technique for an optical sensing system. 4,798,947, Cl. 250-201.000.
Bayer Aktiengesellschaft: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hansaler, Gerd; and Reinecke, Paul, 4,798,899, Cl. 548-262.000.
Hocker, Jurgen; Rottmaier, Ludwig; Reinking, Klaus; Kirsch, Jurgen; and Fullmann, Heinz-Josef, 4,798,686, Cl. 252-500.000.
Hohlein, Peter; Kreiss, Eberhard; Mory, Franz; and Riberi, Bernd, 4,798,859, Cl. 525-7.000.
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Reinecke, Paul; Hansaler, Gerd; and Brandes, Wilhelm, 4,798,905, Cl. 560-16.000.
Meurer, Kurt P.; Waniczek, Helmut; Sylvester, Gerd; and Witte, Josef, 4,798,873, Cl. 525-333.700.
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Wehinger, Egbert; Meyer, Horst; Knorr, Andreas; and Kazda, Stanislav, 4,798,840, Cl. 514-356.000.
Bayer, Antonius L.; Bles, Bernhardus A. L.; Hands, Godfrey; and Hovden, Dag A., to SKF Industrial Trading and Development Co. B.V. Pivot ring. 4,798,299, Cl. 212-157.000.
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Strecker, Ruediger, 4,798,636, Cl. 149-19.900.
BBC Brown Boveri AG: *See*—
Braun, Walter; and Hagmann, Walter, 4,799,238, Cl. 375-56.000.
Jongenburger, Peter; and Singer, Robert, 4,798,625, Cl. 75-235.000.
Mayer, Andreas, 4,798,049, Cl. 60-276.000.
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Ackermann, Ulrich, 4,798,924, Cl. 200-148.00R.
Beatty, Paul: *See*—
Haas, Dave; VanderSyde, Gary; Beatty, Paul; and Roxas, Ren, 4,798,040, Cl. 53-460.000.
Beck, Walter; Berger, Siegfried; and Werner, Margrit, to Beck, Walter; and Werner, Margrit. Method and apparatus for aspirating secreted fluids from a wound. 4,798,583, Cl. 604-48.000.
Becker, E. Robert; and Jung, Hyun J., to Johnson Matthey, Inc. Selective catalytic reduction catalyst consisting of iron sulfate, ceria and alumina. 4,798,817, Cl. 502-217.000.
Becker, Horst P., to Alfred Teves GmbH. Hydraulic brake system for automotive vehicles. 4,798,422, Cl. 303-115.000.
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Penhasi, Harry A., 4,798,579, Cl. 494-18.000.
Bedner, Richard J.; and Yerman, Emil. Cutting blade assembly. 4,798,000, Cl. 30-339.000.
Beecham Group p.l.c.: *See*—
Osborne, Neal F., 4,798,828, Cl. 514-192.000.
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King, Francis D.; and Joiner, Karen A., 4,798,829, Cl. 514-214.000.
Beer, Michael; Hofbauer, August; and Knoll, Erwin, to Dr. Ing. h.c.f. Porsche Aktiengesellschaft. Valve guidance for an exhaust gas valve of an internal combustion engine. 4,798,181, Cl. 123-188.0GC.
Beery, Jack; Nelson, Erik K.; and Shelton, John J., to Mead Corporation, The. Pressure compensated single nip three-roll press. 4,798,134, Cl. 100-171.000.
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Goldstein, Guy; and Pierre, Michel, 4,798,744, Cl. 427-389.900.
Behr, Friedrich: *See*—
Fleischer, Hans-Joachim; Lohscheidt, Klaus; Gorres, Dieter; and Behr, Friedrich, 4,798,631, Cl. 148-3.000.
Beisemann, Gerd: *See*—
Feldmann, Hugo; Hollmann, Friedrich; Gartner, Horst; and Beisemann, Gerd, 4,798,074, Cl. 72-247.000.
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Belanger, James A.; Wentworth, Robert J.; Turner, Barry S.; and Astley, Graham J., 4,798,008, Cl. 34-243.00C.
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Haas, Dave; VanderSyde, Gary; Beatty, Paul; and Roxas, Ren, 4,798,040, Cl. 53-460.000.
Spiece, Rickey J., 4,798,543, Cl. 434-323.000.
Bell, Myron H.: *See*—
Spadafora, Peter J.; Hersberger, Jill G.; Bell, Myron H.; and Harding, Robert L., 4,799,178, Cl. 364-565.000.
Bell South Corporation: *See*—
Smith, Richard B.; and Tolson, Michael T., 4,799,251, Cl. 379-1.000.
Bellis, Robert D., to Coin Controls Limited. Coin dispensing apparatus with ejecting member. 4,798,558, Cl. 453-32.000.
Bellwether, Inc.: *See*—
Jenkins, John W., 4,798,379, Cl. 272-73.000.
Belohlawek, Lothar, to Diamalt Aktiengesellschaft. Process and product of making a vegetable protein hydrolysate food seasoning. 4,798,736, Cl. 426-656.000.
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Jorgensen, Allen R.; Belongia, Larry P.; Gordon, Kenneth A.; and La Haye, John L., 4,798,350, Cl. 242-64.000.
Belzer, Folkert O.; and Southard, James H., to Wisconsin Alumni Research Foundation. Perfusate for the preservation of organs. 4,798,824, Cl. 514-60.000.
Bendix France: *See*—
Fargier, Eric; and Mery, Jean-Claude, 4,798,268, Cl. 188-71.500.
Levrai, Roland; Picot, Pascal; and Riquart, Christian, 4,798,127, Cl. 91-530.000.
Benedict, Robert B., to General Motors Corporation. Double belt tensioner. 4,798,564, Cl. 474-134.000.
Benedikt, Walter; Heess, Gerhard; Herden, Werner; Friese, Karl-Hermann; Reum, Helmut; Schmatz, Jurgen; and Schwab, Siegbert, to Robert Boech GmbH. Surface-gap spark plug for internal combustion engines. 4,798,991, Cl. 313-137.000.
Benteler Industries, Inc.: *See*—
Rigsby, Donald R.; Dehlinger, James R.; and Passmore, David A., 4,798,076, Cl. 72-352.000.
Bentsen, Per, to Minigrip, Inc. Link bag and opening fixture. 4,798,041, Cl. 53-468.000.
Berard, Raymond A., to Acushnet Company. Golf ball with fluorescent cover. 4,798,386, Cl. 273-235.00R.
Berger, Christian, to Rhone-Poulenc Sante. Process for preparing levomepromazine hydrogen maleate. 4,798,895, Cl. 544-41.000.
Berger, Karl-Heinz: *See*—
Blumenthal, Gunter; Neu, Gustav; Berger, Karl-Heinz; and Block, Siegmar, 4,798,417, Cl. 299-1.000.
Berger, Siegfried: *See*—
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Bergeron, Richard: *See*—
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Salzer, Leander J.; and Bergren, Donald A., 4,798,002, Cl. 33-125.00A.
Berliner, Wallace H.: *See*—
Killian, Edmund F.; and Berliner, Wallace H., 4,798,075, Cl. 72-327.000.
Berman, Elliot, to Atlantic Richfield Company. Photoconductive device coontaining electroless metal deposited conductive layer. 4,798,808, Cl. 437-4.000.
Bernardi, Richard T., to Tokyo Shibaura Denki Kabushiki Kaisha. Integrated CT scanner gantry. 4,798,540, Cl. 439-22.000.
Bernardi, Richard T., to Tokyo Shibaura Denki Kabushiki Kaisha. Integrated CT scanner gantry. 4,799,245, Cl. 378-15.000.
Berndt, Mitchell J., to Union Oil Company of California. Low speed shut down apparatus and method for high temperature hammer mills. 4,798,343, Cl. 241-36.000.
Bernhardsson, Sven-Olov; Eriksson, Hans F.; Norberg, Sven P.; Forssell, Lars O. H.; and Lindqvist, Nils R., to Santrade Limited. Ferritic-austenitic stainless steel. 4,798,635, Cl. 148-325.000.
Bernhardt, Wolfgang; and Tischer, Michael, to Robert Bosch GmbH. Plunger system for modulating a brake pressure. 4,798,421, Cl. 303-115.000.
Berns, Joseph F. Machine for forming a chamfered edge on a workpiece. 4,798,109, Cl. 82-2.00R.
Bernstein, Howard L.; Grill, Thomas M.; and Silver, Ronald, to American Telephone and Telegraph Company; AT&T Bell Laboratories; and AT&T Information Systems Inc. Card reader/writer station for use with a personal memory card using differential data transfer. 4,798,322, Cl. 235-487.000.
Bertelli, Guido; Busi, Patrizia; and Locatelli, Renato, to HIMONT Incorporated. Complexes of bismuth or antimony halides with amines, suitable as flame retardants for polymers, and polymer compositions containing same. 4,798,857, Cl. 524-93.000.
Bertin & Cie.: *See*—
Pavlin, Cyrille F.; and Prevost, Marc, 4,798,461, Cl. 356-138.000.
Best, David M. Pipe scraper. 4,798,246, Cl. 166-311.000.
Biancucci, Cesare. Floating device for supporting a swimmer floating on the water even in resting position. 4,798,550, Cl. 441-129.000.
BICC Public Limited Company: *See*—
Knipe, Charles D.; and Mather, Edward L., 4,798,443, Cl. 350-96.230.
Bierich, Eduard: *See*—
Maaz, Gunther; Bierich, Eduard; and Stadler, Eberhard, 4,798,251, Cl. 177-229.000.
Biller, Efim. Process for recovery of polyarylpolyamines. 4,798,909, Cl. 564-334.000.
Billinger, Randy J.; Dotter, Laurel K.; and Gasaway, Tommy D., to American Telephone and Telegraph Company - AT&T Information Systems. Communication facilities access control arrangement. 4,799,255, Cl. 379-189.000.
BIO-Response, Inc.: *See*—
Wilson, Elaine L., 4,798,796, Cl. 435-212.000.
BioMedical Laser Industries: *See*—
Hauze, Dennis R., 4,798,292, Cl. 206-439.000.
Bishop, Timothy E.: *See*—
Zimmerman, John M.; and Bishop, Timothy E., 4,798,852, Cl. 522-96.000.
Bixler, Robert L., Jr.: *See*—
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Bjerkoy, Rolf: *See*—
Langeland, Jan-Age; Gjestrum, Einar; and Bjerkoy, Rolf, 4,798,156, Cl. 114-242.000.
Bjorkholm, Paul J.: *See*—
Annis, Martin; and Bjorkholm, Paul J., 4,799,247, Cl. 378-87.000.
Black & Decker Inc.: *See*—
Grossmann, Horst; and Staas, Ernst, 4,798,001, Cl. 30-355.000.
Blanchard, Richard A.; and Cogan, Adrian, to Siliconix Incorporated. Method for manufacturing a power MOS transistor. 4,798,810, Cl. 437-29.000.
Blanchard, Richard A.; and Cogan, Adrian I., to Siliconix Incorporated. Method and apparatus for increasing breakdown of a planar junction. 4,799,100, Cl. 357-52.000.
Biersch, Eberhard; Burr, August; and Hofmann, Klaus, to Robert Bosch GmbH. Method for controlling and/or regulating the injection molding in injection molding machines. 4,798,692, Cl. 264-40.600.
Bles, Bernhardus A. L.: *See*—
Bayer, Antonius L.; Bles, Bernhardus A. L.; Hands, Godfrey; and Hovden, Dag A., 4,798,299, Cl. 212-157.000.
Blinne, Gerd: *See*—
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Block, Robert E., to Parmley, Robert F.; and Floresni, Marino D. Method and apparatus for applying liquid and dry lawn treatment materials. 4,798,325, Cl. 239-663.000.

Block, Siegmar: *See*—
Blumenthal, Gunter; Neu, Gustav; Berger, Karl-Heinz; and Block, Siegmar, 4,798,417, Cl. 299-1.000.
Bloos, Joseph A. Diving belt. 4,798,497, Cl. 405-186.000.
Blue Circle Industries PLC: *See*—
Mills, Peter S.; and Long, Geoffrey R., 4,798,628, Cl. 106-104.000.
Blumenthal, Gunter; Neu, Gustav; Berger, Karl-Heinz; and Block, Siegmar, to Bochumer Eisenhutte Heintzmann GmbH & Co. HG. Method of separating the upper coal in seams. 4,798,417, Cl. 299-1.000.
Boca-Quest: *See*—
Soullard, Marcel; and Brochard, Victor, 4,797,975, Cl. 17-46.000.
Bochumer Eisenhutte Heintzmann GmbH & Co. HG: *See*—
Blumenthal, Gunter; Neu, Gustav; Berger, Karl-Heinz; and Block, Siegmar, 4,798,417, Cl. 299-1.000.
Bock, Georg: *See*—
Gollinger, Franz X.; and Bock, Georg, 4,798,228, Cl. 137-625.470.
Bodi, Richard, to North American Philips Corp. Shipping tray assembly for an article having casters. 4,798,294, Cl. 206-600.000.
Boeglin, Herman J.: *See*—
Tressler, Richard T.; and Boeglin, Herman J., 4,798,764, Cl. 428-312.600.
Boehm, Detlef M.: *See*—
Becker, Johann A.; and Boehm, Detlef M., 4,798,432, Cl. 350-96.200.
Boehringer Biochemia Robin S.p.A.: *See*—
Gandolfi, Carmelo A.; Spinelli, Silvano; Tofanetti, Odoardo; Russo, Raimondo; and Tognella, Sergio, 4,798,898, Cl. 548-146.000.
Boehringer Ingelheim KG: *See*—
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Boeing Company, The: *See*—
Foote, Eugene B., 4,798,051, Cl. 60-527.000.
Sarr, Dennis P., 4,799,167, Cl. 364-507.000.
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Boen Per, to A/S Sonnichsen Rorvalseverket. Method for extrusion of plastic tubes, and an apparatus for carrying out said method. 4,798,696, Cl. 264-209.200.
Boero, Giancarlo: *See*—
Visca, Mario; Boero, Giancarlo; and Lenti, Daria, 4,798,854, Cl. 523-334.000.
Boffardi, Bennett P.; and Rey, Susan P., to Calgon Corporation. Method for controlling corrosion using molybdate compositions. 4,798,683, Cl. 252-389.540.
Bogatzki, Hans-Ulrich, to Elpatronic AG. Apparatus for checking hollow glass containers. 4,798,096, Cl. 73-12.000.
Bogdanovic, Borislav, to Studiengesellschaft Kohle, GmbH. Method of preparing active magnesium-hydride of magnesium hydrogen-storer systems. 4,798,718, Cl. 423-647.000.
Boger, Manfred: *See*—
Drabek, Jozef; and Boger, Manfred, 4,798,837, Cl. 514-594.000.
Bohandy, Joseph: *See*—
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Bolt Technology Corporation: *See*—
Chelminski, Paul, 4,798,261, Cl. 181-120.000.
Bond, Robert S.: *See*—
Thornthwaite, Ian R.; and Bond, Robert S., 4,798,189, Cl. 123-502.000.
Bonello, Philippe; and Jeanmonod, Maurice, to Sarcem S.A. Guide for a catheter. 4,798,598, Cl. 604-280.000.
Bonomo, Donald J.; and Paulson, Robert C., to Cox-Uphoff International. Method of using a subperiosteal tissue expander. 4,798,205, Cl. 128-344.000.
Boostrom, Roy E., to Perkin-Elmer Corporation, The. Scanning array spectrophotometer. 4,798,464, Cl. 356-328.000.
Booth, Raymond E.; and Miller, Michael E., to Stein Associates, Inc. Breading machine. 4,798,283, Cl. 198-860.500.
Borg-Warner Chemicals, Inc.: *See*—
Grant, Thomas S.; Jalbert, Ronald L.; and Whalen, David, 4,798,865, Cl. 525-92.000.
Born, Reinhard: *See*—
Keller, Heinz; Lehner, Martin; Born, Reinhard; and Lotz, Hans-Georg, 4,798,960, Cl. 250-504.00R.
Borsuk, Leslie M.: *See*—
Clark, Kenneth M.; Borsuk, Leslie M.; and Coutts, Bruce, 4,798,431, Cl. 350-96.200.
Bosch-Siemens Hausgerate GmbH: *See*—
Husslein, Julius; Wittauer, Gunther; Knoll, Helmut; and Dandl, Robert, 4,798,938, Cl. 219-395.000.
Bossert, Heinz: *See*—
Faust, Eberhard; Bossert, Heinz; Niethammer, Kurt; and Ohlhausen, Otto, 4,798,416, Cl. 297-452.000.
Bottacchi, Stefano; and Oselladore, Mauro, to GTE Telecomunicazioni, S.p.A. Driver for a semiconductor laser. 4,799,224, Cl. 372-38.000.
Bottarelli, Teresio; and Nulchis, Antonio. Process for splicing fibers in strips, and a machine for feeding a textile machine incorporating such a process. 4,798,045, Cl. 57-22.000.
Boucher, Richard: *See*—
Morgan, John D.; Giolma, William H.; and Boucher, Richard, 4,798,973, Cl. 307-296.00R.
Bouteyre, Jacques; and Le Floc'H, Christian, to Aerospatiale Societe Nationale Industrielle. Device for the non-destructive inspection of a part by means of optical holography. 4,798,466, Cl. 356-347.000.
Bowden, Wade R., Jr. ; and Rushansky, Yuliy, to Slater Electric, Inc. Method and tool for preparing multi-conductor cable. 4,797,988, Cl. 29-566.400.
Box, Jeffrey L.: *See*—
Johnson, Charles B.; Box, Jeffrey L.; and Hildebrand, David B., 4,799,216, Cl. 370-67.000.
Boxholmkonsult AB: *See*—
Strandberg, Anders, 4,798,475, Cl. 366-160.000.
Boyce, Elvin L., to Professional Tape Converters, Inc. Eye shield. 4,797,956, Cl. 2-431.000.
Boyd, Winnett. Chain wheel assembly. 4,798,565, Cl. 474-158.000.
Boyer, Joseph H.: *See*—
Pavlopoulos, Theodore G.; and Boyer, Joseph H., 4,799,230, Cl. 372-53.000.
Boyer, Robert E. Electrical vented handpiece. 4,798,934, Cl. 219-233.000.
Bradford Company: *See*—
Bradford, Judson A., 4,798,290, Cl. 206-328.000.
Bradford, Judson A., to Bradford Company. Electrostatic discharge carton. 4,798,290, Cl. 206-328.000.
Bradner, Scott: *See*—
Feldman, Joel A.; Ganong, William F., III; and Bradner, Scott, 4,799,262, Cl. 381-43.000.
Brahms, Martin: *See*—
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Brandes, Wilhelm: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,798,899, Cl. 548-262.000.
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Reinecke, Paul; Hanssler, Gerd; and Brandes, Wilhelm, 4,798,905, Cl. 560-16.000.
Brandt, Inc.: *See*—
Taylor, Lawrence D., 4,799,185, Cl. 364-900.000.
Braun, Walter; and Hagmann, Walter, to BBC Brown Boveri AG. Differential phase shift keying method for the transmission of data. 4,799,238, Cl. 375-56.000.
Braun, Walter: *See*—
Weller, Klaus; Braun, Walter; and Nennemann, Harry, 4,798,410, Cl. 296-217.000.
Brauning, Egon, to Protoned B.V. Vertically adjustable swivel chair supporting column. 4,798,358, Cl. 248-161.000.
Breads, Peter R., to Great Lakes Orthodontic Laboratories Inc. Method of making a dental appliance. 4,798,534, Cl. 433-6.000.
Breckner, Kurt, to Eckardt AG. Process and apparatus for the control of the air and fuel supply to a plurality of burners. 4,798,531, Cl. 431-12.000.
Bremmer, Robert A.; Kovner, Vladimir; and Stone, Dennis C., to Magnetic Peripherals Inc. Method and apparatus for recording data. 4,799,112, Cl. 360-31.000.
Brenneman, Allen J.; Buck, Harvey B., Jr.; Pugh, Jerry T.; and Robertson, Steven P., to Miles Inc. Separator device and method. 4,798,577, Cl. 494-67.000.
Breton, Claude: *See*—
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Bridgstock, Eric: *See*—
Kenworthy, David M. A.; Bridgstock, Eric; and Dunkey, Edwin A. W., 4,797,993, Cl. 29-613.000.
Brigati, David J., to Fisher Scientific Co. Device for holding horizontal array of liquid aliquots. 4,798,706, Cl. 422-102.000.
Briggs, Milton; and Teutsch, Erich O., to General Electric Company; and Graham Engineering Corporation. Modular extrusion head. 4,798,526, Cl. 425-113.000.
Brighton, Jeffrey E.: *See*—
Verret, Douglas P.; Brighton, Jeffrey E.; Hollingsworth, Deems R.; and Torreno, Manuel L., Jr., 4,799,099, Cl. 357-50.000.
Brinkmann, Bernd; and Lucas, Hermann-Josef, to Schering Aktiengesellschaft. Synthetic resin compositions shelf-stable under exclusion of moisture. 4,798,878, Cl. 528-28.000.
Brisson, Alfred G.: *See*—
Nowacki, Christopher; and Brisson, Alfred G., 4,798,196, Cl. 128-24.00A.
British Petroleum Company p.l.c., The: *See*—
Allen, Philip C., 4,798,782, Cl. 430-270.000.
Hodgson, Philip K. G.; and Stewart, Nevin J., 4,798,906, Cl. 568-614.000.
British Telecommunications, plc: *See*—
Mortimore, David B., 4,798,436, Cl. 350-96.150.
Preston, Keith, 4,798,439, Cl. 350-96.200.
Brochard, Victor: *See*—
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Brocks, Dietrich: *See*—
Timpl, Rupert; and Brocks, Dietrich, 4,798,800, Cl. 435-273.000.
Brodie, George R. Liquid distribution system. 4,798,138, Cl. 101-365.000.
Brogger, Luthier J. Bohm mechanical system for a woodwind. 4,798,120, Cl. 84-380.00R.
Brons, Henricus M. J.; and Geuze, Maarten M., to Shell Oil Company. Process for the working-up of ethylene/carbon monoxide alternating copolymers. 4,798,884, Cl. 528-491.000.
Bross, Robert M.: *See*—
DeMeo, Deborah A.; Bross, Robert M.; and Cook, Kenneth P., 4,798,580, Cl. 604-30.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hattori, Shigenori; and Yamaguchi, Koshiro, 4,798,487, Cl. 400-223.000.
Ito, Noritugu, 4,798,374, Cl. 271-9.000.
Onoda, Hiroshi; Sakakibara, Kenji; and Akao, Michitoshi, 4,798,485, Cl. 400-54.000.
Yoshimura, Motokazu, 4,799,188, Cl. 364-900.000.
Yoshimura, Motokazu, 4,799,191, Cl. 364-900.000.
Brotzmann, Karl; Fassbinder, Hans-Georg; and Turner, Richard E., deceased (by Turner, Trenna R., executor), to Kloeckner CRA Technologie GmbH. Method for the melt reduction of iron ores. 4,798,624, Cl. 75-38.000.
Brown, Harry J.: *See*—
Doerr, Richard E.; Roberts, Margaret A.; and Brown, Harry J., 4,798,279, Cl. 198-594.000.
Brown, Richard C., to National Research Development Corporation. Blended-fibre filter material. 4,798,850, Cl. 521-134.000.
Brown, Robert A., Jr.: *See*—
King, Harvey M., 4,798,191, Cl. 123-557.000.
Brown, Wayne M.: *See*—
Cunha, Daniel; Brown, Wayne M.; Pool, James E.; and Sheperd, Thomas M., 4,798,141, Cl. 102-293.000.
Bruckner, Ronald L.; and Driscoll, James W., to NCR Corporation. Grabber mechanism for a badge reader terminal. 4,798,945, Cl. 235-479.000.
Brugger, Richard D. Traffic signal. 4,799,060, Cl. 340-907.000.
Brungraber, Robert J. Portable tester for measuring slip resistance. 4,798,080, Cl. 73-9.000.
Brunson, Welton K.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,798,199, Cl. 128-87.00R.
Brunton, Ellis W.; Haynes, Denver J.; and Ross, William M., Jr., to Balanced Energy Company. Pelletization of low-titer lipids. 4,798,737, Cl. 426-602.000.
BSD Medical Corporation: *See*—
Turner, Paul F., 4,798,215, Cl. 128-804.000.
Bubik, Leslie, to Vulcan Equipment Company. Towing apparatus. 4,798,509, Cl. 414-563.000.
Buchanan, Joseph R.: *See*—
Mitchell, Richard A.; and Buchanan, Joseph R., 4,798,223, Cl. 137-312.000.
Buchanan, Randall C.: *See*—
Peters, William F.; and Buchanan, Randall C., 4,798,171, Cl. 119-15.000.
Buchel, Karl H.: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,798,899, Cl. 548-262.000.
Buck, Harvey B., Jr.: *See*—
Brenneman, Allen J.; Buck, Harvey B., Jr.; Pugh, Jerry T.; and Robertson, Steven P., 4,798,577, Cl. 494-67.000.
Budd Company, The: *See*—
Bush, John W., 4,797,987, Cl. 29-433.000.
Budzich, Tadeusz, to Caterpillar Inc. Load responsive system using load responsive pump control of a bypass type. 4,798,126, Cl. 91-518.000.
Buffington, Robert D.; and Lilley, Joseph Y. Method and apparatus for detecting and modifying peripheral curves and junction ridges in contact lenses. 4,798,460, Cl. 356-124.000.
Bui, Le, to Orchid Technology. Interface system between a host computer and a peripheral processor with address detection circuitry. 4,799,150, Cl. 364-200.000.
Bulla, Don A.: *See*—
Murray, Gary P.; Lower, Ralph; Dunham, Byron J.; and Bulla, Don A., 4,798,055, Cl. 62-127.000.
Buller, Michael J., to Rolls-Royce plc. Modified friction locking ring. 4,798,406, Cl. 285-320.000.
Bullock, Charles D.: *See*—
Newhall, Donald H.; Bullock, Charles D.; and Pilcher, James O., 4,798,094, Cl. 73-862.580.
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Bullock, Michael L.: *See*—
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Burke, James E.: *See*—
Furbee, Avery D.; Perno, Salvatore G.; and Burke, James E., 4,799,248, Cl. 378-114.000.
Burke, Victor B. Noncontact gage system utilizing reflected light. 4,798,469, Cl. 356-376.000.
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Burr, August: *See*—
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Bush, John W., to Budd Company, The. Method of assembling a bead lock device and pneumatic tire. 4,797,987, Cl. 29-433.000.
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Bertelli, Guido; Busi, Patrizia; and Locatelli, Renato, 4,798,857, Cl. 524-93.000.
Byren, Robert W., to Hughes Aircraft Company. Auto-boresight technique for self-aligning phase conjugate laser. 4,798,462, Cl. 356-152.000.
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Caduff, Edward A. Building exterior cleansing apparatus. 4,797,969, Cl. 15-302.000.
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California Industrial Products, Inc.: *See*—
Olah, Benjamin, 4,798,507, Cl. 411-175.000.
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Cameron, William M. Combination safety cage for all terrain vehicle. 4,798,399, Cl. 280-756.000.
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Egami, Hidemi; Saito, Katsuo; and Satomura, Hiroshi, 4,798,997, Cl. 315-115.000.
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Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, 4,799,084, Cl. 355-14.0SH.
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Canterberry, J. B.; and Flanigan, David A., to Morton Thiokol, Inc. Rapid buring propellant charge for automobile air bag inflators, rocket motors, and igniters therefor. 4,798,142, Cl. 102-290.000.
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Bullock, Joseph J.; Hatch, Wayne L.; and Tackles, George, 4,798,301, Cl. 215-256.000.
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Carithers, Charles H., Jr. Apparatus for cutting V-grooves in mats. 4,798,118, Cl. 83-875.000.
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Ghosh, Asim; and Toukmanian, Aram H., 4,798,300, Cl. 215-10.000.
Carlton, Donald G., to Fibergrate Corporation. Hold-down clamp. 4,798,029, Cl. 52-177.000.
Carstens, Ronald. Shirt folding and packaging method and apparatus. 4,798,293, Cl. 206-495.000.

Carter, Andrew J., to Smith and Nephew Associated Companies p.l.c. Contoured film. 4,798,604, Cl. 604-383.000.
Carver, Robert G., to Coburn, Inc. Display carrier for articles. 4,798,291, Cl. 206-426.000.
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Caterpillar Inc.: *See*—
Alexander, George F.; Coutant, Alan R.; Fee, David M.; and Riediger, Craig W., 4,798,099, Cl. 74-473.00R.
Budzich, Tadeusz, 4,798,126, Cl. 91-518.000.
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Celanese Fibers, Inc.: *See*—
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Centofanti, Salvatore J.: *See*—
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Central Glass Company, Limited: *See*—
Nagano, Makoto; Nakanishi, Akira; Hiraki, Tomoyoshi; Ueno, Akira; Takahashi, Shoji; Kobayashi, Shuhei; Yamamoto, Akihiro; and Kodama, Fumio, 4,798,758, Cl. 428-213.000.
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Cerni, Samuel; Wilson, John F.; and Gjertsen, Robert K., to Westinghouse Electric Corp. Wear sleeve for a control rod end plug. 4,798,699, Cl. 376-327.000.
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McCormick, Francis P.; Wong, Gail L.; Clark, Robin; Arnheim, Norman; and Nitecki, Danute E., 4,798,787, Cl. 435-7.000.
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Chamaret, Solange: *See*—
Montagnier, Luc; Chamaret, Solange; and Gruest, Jacqueline, 4,798,797, Cl. 435-235.000.
Chambonnet, Bernard, to La Spirotechnique Industrielle et Commerciale. Compressed-air breathing apparatus for underwater diving. 4,798,202, Cl. 128-204.260.
Chan, Harry; and Yi, Basilio. Extruder screw with balanced flights of different functional sections. 4,798,472, Cl. 366-89.000.
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Goel, Anil B.; and Chang, Biau-Hung, 4,798,872, Cl. 558-186.000.
Chang, Fung M.; Hsu, Chien C.; and Chen, Wen C. Pneumatic type of hydraulic structure. 4,798,125, Cl. 91-49.000.
Chang, Jimmy C. K. Kinetic energy reclaiming system for vehicle. 4,798,053, Cl. 60-712.000.
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Chang, Stanley S.; Jones, Robert E.; and Bau, Hui, to Hughes Aircraft Company. Method of fabricating a hollow squarax inner conductor. 4,797,995, Cl. 29-825.000.
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Charlton, John C. Foot-operated door security device. 4,797,970, Cl. 16-82.000.
Chauvel, Gerard, to Texas Instruments Incorporated. System for displaying graphic information on video screen employing video display processor. 4,799,146, Cl. 364-200.000.
Checker Machine, Inc.: *See*—
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Cheeseman, Charles D. Socket-wrench hand tool. 4,798,111, Cl. 81-124.400.
Chelminski, Paul, to Bolt Technology Corporation. Small powerful hydro gun. 4,798,261, Cl. 181-120.000.
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Chen, Paul T. H., to NCR Corporation. Multilayer printed circuit board with domain partitioning. 4,799,128, Cl. 361-414.000.
Chen, Shixian; Wang, Hung S.; and Chang, Linai. Oscillatory tooth and needle gear transmitting devices. 4,798,104, Cl. 74-804.000.
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Cheresnowsky, Michael J., to GTE Products Corporation. Method for producing fine cobalt metal powder. 4,798,623, Cl. 75-0.5AA.
Cherko, Carl F., to Oerlikon Motch Corporation. Combination machine tool apparatus and pallet changing system. 4,797,989, Cl. 29-568.000.
Cherry, Craig D., to Spectra-Physics, Inc. Method and system for control of a bar code scanner threshold. 4,798,943, Cl. 235-463.000.
Cherry, David A.; Maryanoff, Cynthia A.; Mills, John E.; Olofson, Roy A.; and Rodgers, James D., to McNeilab, Inc. Process for producing 1-(5-substituted-2-ethynylphenyl)-2-propanones. 4,798,893, Cl. 544-215.000.
Chesebrough-Pond's Inc.: *See*—
Arnold, Donald L., 4,798,303, Cl. 215-329.000.
Cheung, Kin-Ling: *See*—
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Cheung, Philip S., to Schlumberger Technology Corporation. Method of acoustically detecting fractures in a borehole. 4,799,200, Cl. 367-30.000.
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Chilluffo, Ronald L.; and Gottlieb, Ellis J., to Allied-Signal Inc. Microwave diode tuning circuit. 4,799,035, Cl. 333-223.000.
Chitavat, Anwar. Linear motor with air-lift bearing unloading. 4,798,985, Cl. 310-90.000.
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Chrysler Motors Corporation: *See*—
Eastman, Richard E.; and Jagani, Anand M., 4,798,097, Cl. 74-15.880.
Eastman, Richard E.; and Woodcock, Stewart J., 4,798,103, Cl. 74-740.000.
Chuang, Henry Y. H.; and He, Guo, to University of Pittsburgh. Pipeline feedback array sorter with multi-string sort array and merge tree array. 4,799,152, Cl. 364-200.000.
Chubb, Charles F.; DiMatteo, Paul; and Vaiana, Joseph G., to Nova Technologies Inc. Patient transfer arrangement. 4,797,960, Cl. 5-81.00R.
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Drabek, Jozef; and Boger, Manfred, 4,798,837, Cl. 514-594.000.
Gaell, Laurenz; and Ackermann, Peter, 4,798,912, Cl. 568-637.000.
Jaeggi, Franz-Josef, 4,798,688, Cl. 260-512.00R.
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Rasberger, Michael; Hofmann, Peter; Meier, Hans R.; and Dube, Paul, 4,798,822, Cl. 546-15.000.
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Claar, James A.; Thomas, Stephen J.; and Kindle, Betty J., to PPG Industries, Inc. Basecoat/clearcoat method of coating utilizing an anhydride additive in the thermoplastic polymer-containing basecoat for improved repairability. 4,798,746, Cl. 427-407.100.
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Claassen, Henning J., to Meltex Verbindungs-Technik GmbH. Slit nozzle. 4,798,163, Cl. 118-410.000.
Clagett, Donald C.: *See*—
Maresca, Louis M.; Clagett, Donald C.; and Wascher, Uwe S., 4,798,874, Cl. 525-425.000.
Clairol Incorporated: *See*—
Taylor, David C.; Springer, William E.; Goeller, Loretta; and Santhouse, Daniel, 4,799,124, Cl. 361-42.000.
Clarion Co., Ltd.: *See*—
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Clark, Kenneth M.; Borsuk, Leslie M.; and Coutts, Bruce, to ITT Corporation. Optic fiber contact. 4,798,431, Cl. 350-96.200.
Clark, Kenneth M., to ITT Corporation. Fiber optic device coupling. 4,798,441, Cl. 350-96.200.
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Clements, Thomas R., to United Technologies Corporation. Augmentor pilot. 4,798,048, Cl. 60-261.000.
Clemson University: *See*—
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Cleveland Tramrail International S.A.: *See*—
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Coates, Donald A.; Manthei, Philip J.; and Allen, Max D., to Speed Queen Company. Reversible control console. 4,798,424, Cl. 312-257.00R.

Cobe Laboratories, Inc.: *See*—
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Coburn, Inc.: *See*—
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Coenen, Wilfred: *See*—
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Colin, Joseph F.; Kaercher, Leo T.; and Roberts, Charles D., to Babcock & Wilcox Company, The. Apparatus for controlled slow cooling of steel tubulars. 4,798,368, Cl. 266-259.000.

Collette, Jerry R. Asphalt recycling conveyor. 4,798,533, Cl. 432-227.000.

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Colonel, Richard C.; and Lindh, Devere. Spring apparatus for shoe soles and the like. 4,798,009, Cl. 36-28.000.

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Columbian Chemicals Co.: *See*—
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Connor, Daniel S.: *See*—
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Conoco Inc.: *See*—
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Consolidated Controls Corporation: *See*—
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Container Corporation of America: *See*—
Everman, Wayne F.; Klug, Randy J.; and Russell, Raymond L., 4,798,571, Cl. 493-114.000.

Cook, Kenneth P.: *See*—
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Cook, Stephen J.; and Bullock, Michael L., to Hewlett-Packard Company. Bendable pin board test fixture. 4,799,007, Cl. 324-158.00F.

Cooley, Charles; and Fenton, William, Jr. Electrical continuity load monitoring circuit. 4,799,019, Cl. 324-546.000.

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Cornacchia, Vincent, to General Machine Design, Inc. Conveyor for turning packages upside down. 4,798,278, Cl. 198-399.000.

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Cortesi, Roy L. Container with lining bag dispenser. 4,798,363, Cl. 248-97.000.

Corvita Corporation: *See*—
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Couder, Armand: *See*—
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Crum, James R.: *See*—
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Crystal, Kevin R., to Nicolet Instrument Corporation. Self-aligning fluid bearing. 4,798,478, Cl. 384-12.000.

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D.S.D.P. - S.p.A: *See*—
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D 3 Cathodic Products-Korrosionsschutzprodukte Gesellschaft m.b.H.: *See*—
Herzog, Reinhold; Padinger, Reinhard; Rainer, Hans-Peter; and Schober, Helmo, 4,798,658, Cl. 204-147.000.

Dadbeh, Bemanali H., to Harvard Sports, Inc. Basketball goal height adjustment apparatus. 4,798,381, Cl. 273-1.50R.

Dai, Eugene P.: *See*—
Lewis, Paul H.; Dai, Eugene P.; and Holst, Edward H., 4,798,819, Cl. 502-304.000.

Daidotokushuko Kabushiki Kaisha: *See*—
Tsunashima, Shigeru, 4,799,114, Cl. 360-59.000.

Daily, Joseph V., to Union Carbide Corporation. In-situ pipeline coating system. 4,798,474, Cl. 118-408.000.

Daimler-Benz Aktiengesellschaft: *See*—
Faust, Eberhard; Bossert, Heinz; Niethammer, Kurt; and Ohlhausen, Otto, 4,798,416, Cl. 297-452.000.
Peitsmeier, Karl; and Schremmer, Gottfried, 4,798,067, Cl. 70-252.000.

Dainippon Screen Mfg., Co.: *See*—
Sano, Tetsuo; Hohki, Tetsuo; Kodama, Eiji; Yoshida, Takumi; Kawatani, Masafumi; and Tsujinaka, Hisayuki, 4,799,175, Cl. 364-552.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Sakai, Takamasa, 4,798,926, Cl. 219-10.430.

Dair, Roderick L.: *See*—
Dion, Paul A.; and Dair, Roderick L., 4,798,932, Cl. 219-118.000.

Daiwa Seiko Inc.: *See*—
Kaneko, Kyoichi, 4,798,355, Cl. 242-218.000.
Nanbu, Kazuya; Yamaguchi, Nobuyuki; and Masubuchi, Kaoru, 4,798,354, Cl. 242-84.10R.

D'Alayer de Costemor d'Arc, Stephane, to Staar, S.A. Apparatus and method for maintaining progression of recovery of recorded information. 4,799,207, Cl. 369-58.000.

Dallman, Hermann; Hensel, Hartmut; and Schafer, Werner, to Hoechst Aktiengesellschaft. Multi-layer polyester film for magnetic tape. 4,798,759, Cl. 428-220.000.

Dameron, Rodger S. Nursing shawl. 4,797,953, Cl. 2-104.000.

Dammann, Hans O. B.; Pross, Elke B.; Rabe, Gert; Tolkadorf, Wolfgang F. M.; and Zinke, Manfred B., to U.S. Philips Corp. Optical

polarization regulator having a wave-guide structure. 4,798,434, Cl. 350-96.110.

Dana Corporation: *See*—
Otteson, Jack O., 4,798,258, Cl. 180-175.000.
Pollock, Paul R.; and Stoneburner, Larry P., 4,798,394, Cl. 280-96.100.

Dandl, Robert: *See*—
Husslein, Julius; Wittauer, Gunther; Knoll, Helmut; and Dandl, Robert, 4,798,938, Cl. 219-395.000.

Dardat, Klaus: *See*—
Knothe, Erich; Melcher, Franz-Josef; Maaz, Gunther; Dardat, Klaus; and Sodler, Walter, 4,798,250, Cl. 177-181.000.

Dart, Peter J.; and Hebber, K. Prakash, to Lubrizol Genetics, Inc. Agricultural products from *Pseudomonas cepacia* strains and methods of preparation. 4,798,723, Cl. 424-93.000.

Data Pad Corp.: *See*—
House, V. Dean, 4,799,054, Cl. 340-710.000.

David, Lawrence D., to International Business Machines Corporation. Method of synthesizing amorphous group IIIA-group VA compounds. 4,798,701, Cl. 420-528.000.

Davidson, Dale D.; and Endrud, Douglas G., to Honeywell Inc. Digital automatic flight control system with disparate function monitoring. 4,799,159, Cl. 364-424.060.

Davies, Donald W., to National Research Development Corporation. Apparatus and methods for granting access to computers. 4,799,258, Cl. 380-21.000.

Davies, Trevor P.: *See*—
Bannell, John L. K.; Dixon, Arnold G.; and Davies, Trevor P., 4,799,235, Cl. 374-18.000.

Davis, Mark F.: *See*—
Mandell, Douglas E.; Todd, Craig C.; Allen, Ioan R.; and Davis, Mark F., 4,799,260, Cl. 381-22.000.

Davis, Robert. Article bagger. 4,798,042, Cl. 53-572.000.

Davis, Sydney: *See*—
Malakhoff, Alexander; and Davis, Sydney, 4,798,085, Cl. 73-148.000.

Dawson, Dennis W.: *See*—
Jarnagin, Jerry D.; and Dawson, Dennis W., 4,798,034, Cl. 52-169.500.

Dayton, Douglas C.; Bergeron, Richard; and Shriner, Donald R., to Wang Laboratories, Inc. Portable communication terminal for remote database query. 4,799,254, Cl. 379-97.000.

De La Rue Systems, Limited: *See*—
Martin, Harvey G.; Pilling, Roger; and Hosking, Steven M., 4,798,316, Cl. 232-43.100.

Deacon, Malcolm J., to Marconi Company Limited, The. Impedance matching arrangement. 4,799,066, Cl. 343-861.000.

Deaton, Thomas M.; and Perkins, Donald H., to Otis Engineering Corporation. Solenoid operated safety valve and submersible pump system. 4,798,247, Cl. 166-373.000.

DeBin, Rene F., to FMC Corporation. Bag making machine. 4,798,576, Cl. 493-196.000.

deBoer, Wiebe B.; Jensen, Klavs F.; Johnson, Wayne L.; Read, Gary W.; and Robinson, McDonald, to Epsilon. Apparatus for chemical vapor deposition using an axially symmetric gas flow. 4,798,165, Cl. 118-715.000.

Debrouwer, Yves: *See*—
Penato, Jean M.; Gabbay, Emile; and Debrouwer, Yves, 4,799,250, Cl. 378-144.000.

De Bruycker, Patricia: *See*—
Legrand, Franz; and De Bruycker, Patricia, 4,798,710, Cl. 423-69.000.

Decaux, Jean-Claude. Sanitary unit. 4,797,959, Cl. 4-662.000.

de Chambost, Emmanuel, to THOMSON-CSF. Electronic beam device for projecting an image of an object on a sample. 4,798,953, Cl. 250-310.000.

Deem, James R. Battery disconnect apparatus. 4,798,968, Cl. 307-10.0BP.

Deere & Company: *See*—
Intveld, Dwayne J., 4,798,512, Cl. 414-722.000.
Kaczmarczyk, Edward T.; Rae, Rory; and Noyes, Roger A., 4,798,511, Cl. 414-686.000.
Viaud, Jean; and Gunther, Daniel, 4,798,044, Cl. 56-341.000.

DeForrest, William, Sr. Lock having a reversible right and left hand bolt. 4,798,065, Cl. 70-129.000.

DeForrest, William, Sr. Protecting device for lever handle door locks. 4,798,069, Cl. 70-428.000.

Deglise, Rene , to Ipatec S.A. Process and apparatus for filling containers under vacuum. 4,798,039, Cl. 53-432.000.

Dehlinger, James R.: *See*—
Rigsby, Donald R.; Dehlinger, James R.; and Passmore, David A., 4,798,076, Cl. 72-352.000.

Delaney, Norma G.; Gordon, Eric M.; and Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Certain [(lower alkanoyl-thio)methyl-1-oxo-3-phenyl propyl amino]benzene lower alkanoic acid or ester derivatives which inhibit enkephalinase. 4,798,904, Cl. 558-254.000.

Delaware Capital Formation, Inc.: *See*—
Foster, Michael M.; and Racely, Kermit L., 4,798,267, Cl. 187-28.000.

Delco Electronics Corporation: *See*—
Spadafora, Peter J.; Hersberger, Jill G.; Bell, Myron H.; and Harding, Robert L., 4,799,178, Cl. 364-565.000.

DeMeo, Deborah A.; Bross, Robert M.; and Cook, Kenneth P., to Site Microsurgical Systems, Inc. Disposable peristaltic pump cassette system. 4,798,580, Cl. 604-30.000.

Demoute, Jean-Pierre: *See*—
Tessier, Jean; Demoute, Jean-Pierre; and Taliani, Laurent, 4,798,901, Cl. 548-562.000.

Denzene, Quentin S.: *See*—
Grindahl, Mervin L.; and Denzene, Quentin S., 4,799,059, Cl. 340-870.030.

DePiazzy, Edward F. Animal feeder. 4,798,170, Cl. 119-61.000.

D'Errico, John J.; and Sharp, Kenneth G., to Dow Corning Corporation. Method of selective reduction of halodisilanes with alkyltin hydrides. 4,798,713, Cl. 423-342.000.

Designs Unlimited, Inc.: *See*—
Wilson, Dennis W., 4,798,108, Cl. 81-170.000.

DeSoto, Inc.: *See*—
Zimmerman, John M.; and Bishop, Timothy E., 4,798,852, Cl. 522-96.000.

Deutsche ITT Industries GmbH: *See*—
Mehrgardt, Soenke, 4,799,212, Cl. 370-20.000.

Deutsche Perrot-Bremse GmbH: *See*—
Schneider, Wilhelm; and Keller, Roland, 4,798,270, Cl. 188-264.00G.

DeVilbiss Company, The: *See*—
Gimple, James J., 4,798,341, Cl. 239-694.000.

De Vrieze, Henricus M.: *See*—
Rijpers, Johannes C. N.; and De Vrieze, Henricus M., 4,798,994, Cl. 313-478.000.

Diamalt Aktiengesellschaft: *See*—
Belohlawek, Lothar, 4,798,736, Cl. 426-656.000.

Diamond, Howard. Multiparameter analytical electrode structure and method of measurement. 4,798,655, Cl. 204-1.00T.

Diaz-Kotti, Michelle A., to Asten Group, Inc. Superimposed wet press felt. 4,798,760, Cl. 428-234.000.

Diethelm, Hermann, to Ciba-Geigy Corporation. Hot-foamable, thermosetting epoxy resin mixture. 4,798,848, Cl. 521-89.000.

Dietz, Ronald P.; and Johnson, Jeffrey D., to Orbital Sciences Corporation II. Majority vote sequencer. 4,799,140, Cl. 364-140.000.

Digital Equipment Corporation: *See*—
Felker, Michael; and Viverito, Angelo, 4,799,211, Cl. 370-17.000.
Melanson, Ronald J.; and Yang, Ji L., 4,798,972, Cl. 307-270.000.
Rose, Robert C.; and Forrester, Ned C., 4,799,173, Cl. 364-518.000.

DiMatteo, Paul: *See*—
Chubb, Charles F.; DiMatteo, Paul; and Vaiana, Joseph G., 4,797,960, Cl. 5-81.00R.

Dinwoodie, Robert C.: *See*—
Mehnert, David W.; and Dinwoodie, Robert C., 4,798,798, Cl. 435-239.000.

Dion, Paul A.; and Dair, Roderick L., to Polymetallurgical Corporation. Solid phase edge bonding of metal strips. 4,798,932, Cl. 219-118.000.

Dischler, Helmut. Bending machine for bending bars, channels, sections and the like. 4,798,073, Cl. 72-218.000.

Divine, Charles A., Jr.: *See*—
McCune, Harry E., III; and Divine, Charles A., Jr., 4,798,634, Cl. 148-325.000.

Dixon, Alfred R. Door water deflector and vent. 4,798,130, Cl. 98-2.180.

Dixon, Arnold G.: *See*—
Bannell, John L. K.; Dixon, Arnold G.; and Davies, Trevor P., 4,799,235, Cl. 374-18.000.

Djupsjobacka, Anders G., to Telefonaktiebolaget LM Ericsson. Optoelectric connection device. 4,798,429, Cl. 350-96.140.

DNAX Research Institute of Molecular and Cellular Biology, Inc.: *See*—
Lee, Frank D.; Yokota, Takashi; and Arai, Ken-ichi, 4,798,789, Cl. 435-68.000.

Dr. Ing. h.c.f. Porsche Aktiengesellschaft: *See*—
Beer, Michael; Hofbauer, August; and Knoll, Erwin, 4,798,181, Cl. 123-188.0GC.
Eger, Georg; and Srock, Rainer, 4,797,971, Cl. 16-82.000.
Weller, Klaus; Braun, Walter; and Nennemann, Harry, 4,798,410, Cl. 296-217.000.

Doerr, Richard E.; Roberts, Margaret A.; and Brown, Harry J., to Consolication Coal Company. Mine haulage method and apparatus. 4,798,279, Cl. 198-594.000.

Dolby Laboratories Licensing Corporation: *See*—
Mandell, Douglas E.; Todd, Craig C.; Allen, Ioan R.; and Davis, Mark F., 4,799,260, Cl. 381-22.000.

Dolomite S.p.A.: *See*—
Annovi, Giuseppe, 4,798,933, Cl. 219-211.000.

Domges, Gunther: *See*—
Zangenfeind, Helmut; Domges, Gunther; and Wurfel, Reinhart, 4,799,076, Cl. 354-308.000.

Donohoe, David G., to Aquarian Accessories Corporation. Impact resistant drumhead. 4,798,121, Cl. 84-414.000.

Donomoto, Tadashi; Koyama, Mototsugu; and Nagaoka, Masaaki, to Toyota Jidosha Kabushiki Kaisha. Heat resisting and insulating light alloy articles and method of manufacture. 4,798,770, Cl. 428-547.000.

Dooley, James E. Volleyball spiking tee. 4,798,390, Cl. 273-411.000.

Doppelt, Samuel H. Bone biopsy apparatus. 4,798,213, Cl. 128-754.000.

Dorler, Jack A.: *See*—
Curtin, James J.; Dorler, Jack A.; Jordy, George J.; and Leiner, Kenneth L., 4,798,976, Cl. 307-441.000.

Dosaj, Vishu D.; Filsinger, Daniel H.; and Trunzo, James E., to Dow Corning Corporation. Addition of calcium compounds to the carbothermic reduction of silica. 4,798,659, Cl. 204-164.000.

Dotter, Laurel K.: *See*—
Billinger, Randy J.; Dotter, Laurel K.; and Gasaway, Tommy D., 4,799,255, Cl. 379-189.000.

Double, Glen P.: *See*—
Abraham, Dennis G.; Double, Glen P.; and Neckyfarow, Steven W., 4,799,061, Cl. 340-825.340.

Douglas, James R., to Eaton Corporation. Method for producing a family of forged ring rolling preforms and forging die therefor. 4,798,077, Cl. 72-360.000.

Douglas, Joseph; and Jennings, Richard P., to ROLLS-ROYCE plc. Data selection circuits, systems and methods. 4,799,190, Cl. 364-900.000.

Dow Chemical Company, The: *See*—
Hazlitt, Lonnie G.; and Moldovan, Daniel G., 4,798,081, Cl. 73-53.000.
Hefner, Robert E., Jr., 4,798,908, Cl. 564-153.000.
Hoffman, Dwight K.; Harris, Robert F.; and Hickner, Richard A., 4,798,877, Cl. 525-531.000.
Lewis, John W., 4,798,508, Cl. 414-412.000.
Thomas, Oomman P.; and Turner, Robert B., 4,798,849, Cl. 521-114.000.
Wolcott, Duane K.; Graves, Ernest D., Jr.; and Hunt, David G., 4,798,803, Cl. 436-52.000.
Wykowski, Paul L.; and Puckett, Paul M., 4,798,761, Cl. 428-272.000.

Dow Corning Corporation: *See*—
Baizer, William X.; Bixler, Robert L., Jr.; Meddaugh, Michael D.; and Wright, Antony P., 4,798,818, Cl. 502-228.000.
D'Errico, John J.; and Sharp, Kenneth G., 4,798,713, Cl. 423-342.000.
Dosaj, Vishu D.; Filsinger, Daniel H.; and Trunzo, James E., 4,798,659, Cl. 204-164.000.
Plueddemann, Edwin P.; and Bank, Howard M., 4,798,889, Cl. 556-401.000.

Downs, David A.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, to Warner-Lambert Company. Tetrahydropyridine oxime cholinergic agents and method of treatment. 4,798,841, Cl. 514-357.000.

Downs, Kenneth L.: *See*—
Abuaf, Nesim; Barito, Robert W.; and Downs, Kenneth L., 4,798,753, Cl. 428-69.000.

Drabek, Jozef; and Boger, Manfred, to Ciba-Geigy Corporation. Benzoylphenylureas. 4,798,837, Cl. 514-594.000.

Dragerwerk AG: *See*—
Banziger, Fritz A.; and Klein, Peter, 4,799,263, Cl. 381-94.000.

Dragerwerk Aktiengesellschaft: *See*—
Heim, Ulrich; and Albarda, Scato, 4,798,689, Cl. 261-39.100.

Drago, Russell S.; and Getty, Edward E., to University of Florida. Hydrocarbon conversion polymerization catalyst and method of making and using same. 4,798,667, Cl. 208-117.000.

Drexelbrook Controls, Inc.: *See*—
Kramer, L. Jonathan; and Petersen, Steven R., 4,799,174, Cl. 364-550.000.

Driggers, Bernard M., to White Consolidated Industries, Inc. Stress-limiting flexible throttle lever apparatus for a gasoline engine driven power tool or the like. 4,798,185, Cl. 123-400.000.

Driscoll, James W.: *See*—
Bruckner, Ronald L.; and Driscoll, James W., 4,798,945, Cl. 235-479.000.

Drusinsky, Doron; and Harel, David, to Yeda Research and Development Company Limited. Electronic controller based on the use of state charts as an abstract model. 4,799,141, Cl. 364-141.000.

Drutel, Yves: *See*—
Arbeille, Yves; Drutel, Yves; and Viguier, Alain, 4,799,160, Cl. 364-424.100.

Dual-Lite Manufacturing: *See*—
Balcom, James E.; Kozek, Edward P.; and Alderman, Arnold N., 4,799,039, Cl. 340-333.000.

Dubrul, William R.: *See*—
Hancock, John C.; Dubrul, William R.; and Heyler, Charles J., III, 4,798,584, Cl. 604-93.000.

Dubs, Paul: *See*—
Rasberger, Michael; Hofmann, Peter; Meier, Hans R.; and Dubs, Paul, 4,798,822, Cl. 546-15.000.

Dubuit, Jean-Louis; and Rouly, Eric, to Machines Dubuit. Distribution device for delivering vertically disposed objects one by one to a conveyor. 4,798,277, Cl. 198-397.000.

Dugan, Larry M., to Adolph Coors Company. Can filling system. 4,798,234, Cl. 141-165.000.

Dugdale, Marion: *See*—
Lasslo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., 4,798,830, Cl. 514-314.000.

Duis, Wilhelm, to J. D. Moller Optische Werke GmbH. Optical sensor arrangement. 4,798,966, Cl. 250-578.000.

Dumonceaux, Gary W.; Weber, Edwin R.; and Gibbs, James D. Floatable baby carrier. 4,798,551, Cl. 441-130.000.

Dunaway, Weyman H.; and Salinas, Jorge E., to E.C.C. America Inc. Process for surface treating clay minerals and reactive intermediates produced by said process. 4,798,630, Cl. 106-287.100.

Duncan, Robert J.: *See*—
McLean, Jean A.; and Duncan, Robert J., 4,799,268, Cl. 382-8.000.

Dunham, Byron J.: *See*—
Murray, Gary P.; Lower, Ralph; Dunham, Byron J.; and Bulla, Don A., 4,798,055, Cl. 62-127.000.

Dunkerly, Cedric A., II: *See*—
Meyer, Stephen C.; Lance, Roger L.; Hetzler, Connie L.; Dunkerly, Cedric A., II; Roessler, Thomas H.; Zenker, David L.; and Sciaraffa, Michael A., 4,798,603, Cl. 604-378.000.

Dunkey, Edwin A. W.: *See*—
Kenworthy, David M. A.; Bridgstock, Eric; and Dunkey, Edwin A. W., 4,797,993, Cl. 29-613.000.

Duphar International Research B.V.: *See*—
Mijers, Jan W. M.; and Steenhuisen, Johannes E., 4,798,671, Cl. 210-238.000.

Du Pont de Nemours, E. I., and Company: *See*—
Ackerson, Robert C.; and Yuyama, Takeshi, 4,798,621, Cl. 71-90.000.
El-Sayed Lyla M.; Schmidt, Steven P.; Trout, Torence J.; and Mitchell, Robert D., 4,798,778, Cl. 430-115.000.
Harder, Patricia A.; and Kunz, Daniel A., 4,798,792, Cl. 435-119.000.
Kam, Sheung T.; Matier, William L.; Patil, Ghanshyam; and Mai, Khuong H. X., 4,798,892, Cl. 544-146.000.
Lodoen, Gary A., 4,798,880, Cl. 528-63.000.
Nelson, Jeffrey W., 4,798,741, Cl. 427-213.330.
Putzig, Donald E., 4,798,902, Cl. 556-54.000.

Duret, Jean. Drogue associated with a guidance system. 4,798,157, Cl. 114-253.000.

Duret, Robert; and Fleury, Georges, to Thomson-C.S.F. Electron gun for electronic tubes. 4,798,993, Cl. 313-447.000.

Dyma, Horst: *See*—
Gorner, Horst; and Dyma, Horst, 4,798,944, Cl. 235-475.000.

E.A.S. Technologies, Inc.: *See*—
Fearon, Edward R.; and Fearon, Robert E., 4,799,045, Cl. 340-572.000.

E.C.C. America Inc.: *See*—
Dunaway, Weyman H.; and Salinas, Jorge E., 4,798,630, Cl. 106-287.100.
Rice, Camilla A., 4,798,766, Cl. 428-404.000.

E. R. Squibb & Sons, Inc.: *See*—
Delaney, Norma G.; Gordon, Eric M.; and Ondetti, Miguel A., 4,798,904, Cl. 558-254.000.

Eastman Kodak Company: *See*—
Jakubowicz, Raymond F.; and Lercher, John S., 4,798,705, Cl. 422-63.000.
Lentz, Carl M.; Gustafson, Bruce L.; and Wehner, Paul S., 4,798,911, Cl. 368-747.000.
Pan, Kee-Chuan; Tyan, Yuan-Sheng; and Vazan, Fridrich, 4,798,785, Cl. 430-495.000.
Pingaud, Bernard J., 4,798,622, Cl. 75-0.5AA.
Zeise, Eric K.; and Ng, Yee S., 4,799,071, Cl. 346-160.000.

Eastman, Richard E.; and Jagani, Anand M., to Chrysler Motors Corporation. Transfer case planetary with annulus gear power takeoff. 4,798,097, Cl. 74-15.880.

Eastman, Richard E.; and Woodcock, Stewart J., to Chrysler Motors Corporation. Automatic transmission with add-on overdrive. 4,798,103, Cl. 74-740.000.

Eaton Corporation: *See*—
Douglas, James R., 4,798,077, Cl. 72-360.000.

Ebinuma, Takanori; Kato, Hiroshi; and Sakurai, Mituko, to Komatsu Zenoah Co. Portable engine. 4,798,182, Cl. 123-195.00R.

Eckardt AG: *See*—
Breckner, Kurt, 4,798,531, Cl. 431-12.000.

Eda, Kensaku: *See*—
Sugino, Kenji; Yanaida, Katsuya; Sugino, Hiroshi; Nakaya, Masao; Nishida, Nobuo; and Eda, Kensaku, 4,798,339, Cl. 239-601.000.

Edman, Walter W.; and Klemm, Ernest J., to Zotos International, Inc. Permanent waving composition. 4,798,722, Cl. 424-72.000.

Egami, Hidemi; Saito, Katsuo; and Satomura, Hiroshi, to Canon Kabushiki Kaisha. Lighting device. 4,798,997, Cl. 315-115.000.

Eger, Georg; and Srock, Rainer, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Adjusting device for a vehicle door. 4,797,971, Cl. 16-82.000.

Egger, Walter C., to VT-Verpackungstechnik Zurich. Carrier for use on a drag chain conveyor. 4,798,281, Cl. 198-698.000.

Eguchi, Hirotugu, to Nippon Electric Co., Ltd. Substrate bias through polysilicon line. 4,799,101, Cl. 357-59.000.

Eguchi, Ken: *See*—
Tomida, Yoshinori; Sakai, Kunihiro; Matsuda, Hiroshi; Kawada, Haruki; Eguchi, Ken; Kimura, Toshiaki; Takimoto, Kiyoshi; Saitoh, Kenji; and Miyazaki, Toshihiko, 4,798,740, Cl. 427-43.100.

Eichenlaub, John E. Explosion-proof, pollution-free infrared dryer. 4,798,007, Cl. 34-4.000.

Eiermann, Horst W.; and Muhl, Christian, to PCT Pyrochemtek AG; Chemische Fabrik Grunau GmbH; and Muhl, Christian. Kit for producing fireproof cable ducts. 4,798,917, Cl. 174-72.00R.

Eigtved, Peter, to Novo Industri A/S. Immobilized Mucor miehei lipase for transesterification. 4,798,793, Cl. 435-134.000.

Einarson, Jeffrey W.; and Cheung, Kin-Ling, to Wang Laboratories, Inc. Memory address generator with device address type specifier. 4,799,187, Cl. 364-900.000.

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El-Sayed Lyla M.; Schmidt, Steven P.; Trout, Torence J.; and Mitchell, Robert D., to Du Pont de Nemours, E. I., and Company. Liquid electrostatic developers containing modified resin particles. 4,798,778, Cl. 430-115.000.

Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, to Bayer Aktiengesell-

schaft. Combating fungi with novel azolyl-tetrahydrofuran-2-ylidene-methanes. 4,798,899, Cl. 548-262.000.
Elco Co., Ltd.: *See*—
Yagi, Hiroshi, 4,798,538, Cl. 434-262.000.
Electric Power Research Institute, Inc.: *See*—
Levy, Sheldon L., 4,798,690, Cl. 264-1.700.
Eli Lilly and Company: *See*—
Merritt, Leander; and Ward, John S., 4,798,834, Cl. 514-288.000.
Eligehausen, Hans: *See*—
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Elliott, Stythe T.: *See*—
Janesick, James R.; and Elliott, Stythe T., 4,798,958, Cl. 250-370.010.
Elliott Turbomachinery Co., Inc.: *See*—
Geary, Carl H., 4,798,047, Cl. 60-39.092.
Ellis, David C.: *See*—
Barnett, Barry R. M.; and Ellis, David C., 4,797,983, Cl. 24-289.000.
Elpatronic AG: *See*—
Bogatzki, Hans-Ulrich, 4,798,096, Cl. 73-12.000.
Elpern, David G.: *See*—
Glaser, Jerry; and Elpern, David G., 4,798,523, Cl. 417-407.000.
Elsasser, Martin; and Schaberle, Erwin, to Sulzer Morat GmbH. Cam segment for a knitting machine. 4,798,064, Cl. 66-57.000.
Elschenbroich, Walter: *See*—
Wittkopp, Helmut; Gruteser, Helmut; Coenen, Wilfred; and Elschenbroich, Walter, 4,798,963, Cl. 250-560.000.
Eltech Systems Corporation: *See*—
Hardee, Kenneth L.; and Sacco, Anthony R., 4,798,715, Cl. 423-478.000.
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Emerson, Wayne C., to Acme Electric Corporation. Dielectric strength tester. 4,799,130, Cl. 361-437.000.
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Foster, Thomas V.; Jones, Stanley P.; and Alderson, David L., 4,798,617, Cl. 65-25.100.
Empi, Inc.: *See*—
Nippoldt, Robert H.; Rocheleau, Gary A.; and Wright, Thomas C., 4,798,197, Cl. 128-25.00R.
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Vichon, Didier; Bardon, Dominique; and Encrenaz, Christian, 4,798,449, Cl. 350-358.000.
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English, James D., to Tektronix, Inc. Time variant frequency correction technique. 4,799,020, Cl. 324-79.00R.
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Faggian, Lucio; Marcotullio, Armando; Platone, Edoardo; and Picchi, Emilio, 4,798,915, Cl. 585-833.000.
Enichem Tecnoresine S.p.A.: *See*—
Petri, Alberto, 4,798,882, Cl. 528-190.000.
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Grindahl, Mervin L.; and Denzene, Quentin S., 4,799,059, Cl. 340-870.030.
Environmental Fragrance Technologies, Ltd.: *See*—
Pezaris, Constantine D., 4,798,935, Cl. 219-272.000.
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Erb, Robert C. Autoclavable laser beam manipulator. 4,798,452, Cl. 350-632.000.
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Neumann, Burkhard; and Stankewitz, Hans-Werner, 4,798,948, Cl. 250-201.000.
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Erwin Sick GmbH Optik-Elektronik: *See*—
Fetzer, Gunter; and Smetana, Klaus, 4,798,965, Cl. 250-573.000.
ESB Elektrostatische Spruh- und Beschichtungsanlagen G.F. Vohringer GmbH: *See*—
Vohringer, Gerhard F.; and Pfeifer, Kurt, 4,798,340, Cl. 239-692.000.
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Joncour, Christian, 4,798,459, Cl. 356-127.000.
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Kochilla, Richard J.; and Esterle, Otto J., 4,798,657, Cl. 204-147.000.
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Hargis, Duane C., 4,798,894, Cl. 544-277.000.
Stahly, G. Patrick, 4,798,900, Cl. 548-461.000.
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Pasquier, Armand, 4,798,012, Cl. 37-219.000.
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Everitt, George F.; Johnson, Terence P.; and Pham, Lien-Huong A., to Minnesota Mining and Manufacturing Company. Oxidation resistant alumina-silica articles containing silicon carbide and carbon. 4,798,814, Cl. 501-89.000.
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Evrard, William E. Compartmented cleaning bucket. 4,798,307, Cl. 220-20.500.
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Laus, Guy G., 4,798,602, Cl. 604-372.000.
Eylers, Dieter; and Bamberger, Hans, to Gottlieb Roll GmbH & Co. Pocket clip for writing instruments. 4,797,982, Cl. 24-11.00R.
F. O. Schoedinger, Inc.: *See*—
Weidl, David, 4,798,033, Cl. 52-94.000.
Faasse, Adrian L., Jr. Diagnostic electrode. 4,798,208, Cl. 128-640.000.
Faggian, Lucio; Marcotullio, Armando; Platone, Edoardo; and Picchi, Emilio, to Eniricerche S.p.A.; and Enichem Augusta S.p.A. Process for the extraction of paraffins from mixtures thereof with alkane-sulfonic acids. 4,798,915, Cl. 585-833.000.
Fain, Charles C., to Clemson University. Nested ceramic fibers and piggyback micro-mold method for producing same. 4,798,815, Cl. 428-373.000.
Fang, Ho T., to Allied-Signal Inc. Ceramic-metal brazed joint for turbochargers. 4,798,320, Cl. 228-122.000.
Fang, Rong-Chin, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Three time slot digital subscriber line termination. 4,799,217, Cl. 370-68.100.
Fanuc Ltd.: *See*—
Tanaka, Kunio; Takegahara, Takashi; and Onishi, Yasushi, 4,799,143, Cl. 364-191.000.
Farbood, Mohamad I.; and Willis, Brian J., to Fritzsche Dodge & Olcott Inc. Process for producing diol and furan and microorganism capable of same. 4,798,799, Cl. 435-254.000.
Fargier, Eric; and Mery, Jean-Claude, to Bendix France. Multiple disc brake. 4,798,268, Cl. 188-71.500.
Farley, Brent L. Elastomeric bladder for dispensing ice cream. 4,798,313, Cl. 222-192.000.
Faron, Eugene J.: *See*—
Friedman, Robert B.; Gottneid, David J.; Faron, Eugene J.; Pastek, Frank J.; and Katz, Frances R., 4,798,735, Cl. 426-578.000.
Farrell, James F.: *See*—
Prince, John C.; and Farrell, James F., 4,799,050, Cl. 340-765.000.
Farrell, Robert C., to General Motors Corporation. Unitized wheel bearing assembly. 4,798,560, Cl. 464-178.000.
Fassbender, Rolf, to Zahnradfabrik Friedrichshafen, AG. Hydrostatic auxiliary steering device. 4,798,256, Cl. 180-133.000.
Fassbinder, Hans-Georg: *See*—
Brotzmann, Karl; Fassbinder, Hans-Georg; and Turner, Richard E., deceased, 4,798,624, Cl. 75-38.000.
Faust, Eberhard; Bossert, Heinz; Niethammer, Kurt; and Ohlhausen, Otto, to Daimler-Benz Aktiengesellschaft. Seat, particularly a vehicle seat. 4,798,416, Cl. 297-452.000.
Fawcett, William H. Multi-swivel chair. 4,798,361, Cl. 248-415.000.
Fearon, Edward R.; and Fearon, Robert E., to E.A.S. Technologies, Inc. Method of detecting a label used in an anti-theft surveillance system. 4,799,045, Cl. 340-572.000.
Fearon, Robert E.: *See*—
Fearon, Edward R.; and Fearon, Robert E., 4,799,045, Cl. 340-572.000.
Fee, David M.: *See*—
Alexander, George F.; Coutant, Alan R.; Fee, David M.; and Riediger, Craig W., 4,798,099, Cl. 74-473.00R.
Feilhauer, Helmut; and Steimle, Josef, to ANT Nachrichtentechnik GmbH. Method of aligning two optical fiber ends for frontal contact. 4,798,442, Cl. 350-96.210.
Feldman, Joel A.; Ganong, William F., III; and Bradner, Scott, to Kurzweil Applied Intelligence, Inc. Speech recognition. 4,799,262, Cl. 381-43.000.
Feldmann, Hugo; Hollmann, Friedrich; Gartner, Horst; and Beisemann, Gerd, to SMS Schloemann-Siemag Aktiengesellschaft. Rolling mill stand, especially for rolling strip. 4,798,074, Cl. 72-247.000.
Felker, Michael; and Viverito, Angelo, to Digital Equipment Corporation. Apparatus and method for storing performance parameters of local area network system members. 4,799,211, Cl. 370-17.000.
Fenton, William, Jr.: *See*—
Cooley, Charles; and Fenton, William, Jr., 4,799,019, Cl. 324-546.000.
Ferd. Ruesch AG: *See*—
Keller, Heinz; Lehner, Martin; Born, Reinhard; and Lotz, Hans-Georg, 4,798,960, Cl. 250-504.00R.
Ferguson, Benjamin A.: *See*—
Simons, Frank H.; and Ferguson, Benjamin A., 4,798,152, Cl. 112-262.100.

Fernandes, Roosevelt A. Electrical power line parameter measurement apparatus and systems, including compact, line-mounted modules. 4,799,005, Cl. 324-127.000.

Fetzer, Gunter; and Smetana, Klaus, to Erwin Sick GmbH Optik-Elektronik. Optical autocollimation measuring apparatus. 4,798,965, Cl. 250-573.000.

FGL Projects Limited: *See—*
Gannon, Raymond, 4,798,324, Cl. 229-125.350.

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Carlton, Donald G., 4,798,029, Cl. 52-177.000.

Fichtel & Sachs AG: *See—*
Keller, Josef; and Steuer, Werner, 4,798,098, Cl. 74-470.000.

Filsinger, Daniel H.: *See—*
Dosaj, Vishu D.; Filsinger, Daniel H.; and Trunzo, James E., 4,798,659, Cl. 204-164.000.

Fink, Joel H., to United States of America, Energy. Astable resonator photoneutralization apparatus. 4,798,952, Cl. 250-251.000.

Finkbeiner, Gerhard. Hydraulic hoist platform. 4,798,266, Cl. 187-8.710.

Firestone Tire & Rubber Company, The: *See—*
Geno, Wayne H.; and Weitzenhof, David A., 4,798,369, Cl. 269-64.110.
Koch, Russell W.; and Snyder, Douglas D., 4,798,640, Cl. 156-95.000.
Loeffler, Earl F., 4,798,276, Cl. 198-378.000.

Firmich SA: *See—*
Holzner, Gunter, 4,798,288, Cl. 206-222.000.

Firooz, Kamran; Harwood, Vance R.; Illick, Robert C., Jr.; and Crook, David T., to Hewlett-Packard Company. Circuits and apparatus which enable elimination of setup time and hold time testing errors. 4,799,023, Cl. 328-110.000.

Fischer, Helmut, to Siemens Aktiengesellschaft. Circuit arrangement to monitor the time spacing of signals. 4,799,024, Cl. 328-110.000.

Fischer, Helmut. Apparatus for measuring the thickness of thin layers. 4,799,246, Cl. 378-50.000.

Fishburn, John D., to Combustion Engineering, Inc. Mill exhaust system. 4,798,344, Cl. 241-79.100.

Fisher Scientific Co.: *See—*
Brigati, David J., 4,798,706, Cl. 422-102.000.

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Tseo, Gus G., 4,798,589, Cl. 604-152.000.

Fitzgerald, John, to Standard Telephones & Cables. Data transmission system. 4,799,213, Cl. 370-30.000.

Flanigan, David A.: *See—*
Canterberry, J. B.; and Flanigan, David A., 4,798,142, Cl. 102-290.000.

Fleischer, Hans-Joachim; Lohscheidt, Klaus; Gorres, Dieter; and Behr, Friedrich, to Thyssen Aktiengesellschaft vorm August Thyssen-Hutte. Metallic semi-finished product, processes for its preparation and its use. 4,798,631, Cl. 148-3.000.

Flesher, Peter: *See—*
Johnson, Ian M.; Moody, Ian M.; and Flesher, Peter, 4,798,861, Cl. 524-458.000.
Symes, Kenneth C.; and Flesher, Peter, 4,798,888, Cl. 536-123.000.

Fletcher-Terry Company, The: *See—*
Kozyrski, Vincent T.; and Peters, Alan R., 4,798,112, Cl. 83-455.000.

Fleury, Georges: *See—*
Duret, Robert; and Fleury, Georges, 4,798,993, Cl. 313-447.000.

Flodins Filter AB: *See—*
Siverson, Per-Erik, 4,798,575, Cl. 493-346.000.

Flogel, Karl: *See—*
Lierke, Ernst-Gunter; Grossbach, Rudolf; Heide, Wolfgang; Flogel, Karl; and Junger, Martin, 4,798,332, Cl. 239-102.200.

Floreani, Marino D.: *See—*
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Florkey's Conveyor Service, Inc.: *See—*
Hoffmann, Frank F., 4,798,149, Cl. 105-155.000.

Floyd, Merry E.: *See—*
Tung, William C. T.; and Floyd, Merry E., 4,798,883, Cl. 528-272.000.

FMC Corporation: *See—*
DeBin, Rene F., 4,798,576, Cl. 493-196.000.
Lagain, Georges, 4,798,573, Cl. 493-204.000.

Fogarty, Thomas J.: *See—*
Giesy, Jerry D.; Hermann, George D.; and Hoskins, Matthew W., 4,798,193, Cl. 128-7.000.

Fong, James C., to Tong-Fong Brush Factory Co., Ltd. Anti-electrostatic brush. 4,797,966, Cl. 15-186.000.

Foote, Eugene B., to Boeing Company, The. Rotary actuator with tailored torque output. 4,798,051, Cl. 60-527.000.

Ford Motor Company: *See—*
Patil, Prabhakar B., 4,799,158, Cl. 364-424.100.

Forde, Liam. Umbrella package. 4,798,219, Cl. 135-16.000.

Forrester, Ned C.: *See—*
Rose, Robert C.; and Forrester, Ned C., 4,799,173, Cl. 364-518.000.

Forssell, Lars O. H.: *See—*
Bernhardsson, Sven-Olov; Eriksson, Hans F.; Norberg, Sven P.; Forssell, Lars O. H.; and Lindqvist, Nils R., 4,798,635, Cl. 148-325.000.

Foster, Michael M.; and Racely, Kermit L., to Delaware Capital Formation, Inc. Elevator system having an improved selector. 4,798,267, Cl. 187-28.000.

Foster-Miller, Inc.: *See—*
Stevenson, William A., 4,798,954, Cl. 250-341.000.

Foster, Milton E. Champagne bottle cork puller and inserting apparatus. 4,798,106, Cl. 81-3.290.

Foster, Thomas V.; Jones, Stanley P.; and Alderson, David L., to Emhart Industries, Inc. Method of forming a parison in the manufacture of hollow articles of glassware. 4,798,617, Cl. 65-25.100.

Foster Wheeler Energy Corporation: *See—*
VanRhyn, Lucas H., 4,798,928, Cl. 219-60.200.

Fountain, Terence J.: *See—*
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Fox Pool Corporation: *See—*
Weir, Donald H.; and Robinson, Charles F., 4,797,957, Cl. 4-506.000.

Franck, Burchard; and Goamann, Martin, to BASF Aktiengesellschaft. Vinylogous porphyrins. 4,798,891, Cl. 540-472.000.

Frank, Hubertus, to INA Walzlager Schaeffler KG. Rolling bearing slewing ring. 4,798,481, Cl. 384-477.000.

Frank, Jeffrey E., to Marathon Oil Company. Method of treating heterogeneous formation with potassium hydroxide. 4,798,245, Cl. 166-281.000.

Franklin, James L., to Sigma Research, Inc. Direct expansion solar collector-heat pump system. 4,798,056, Cl. 62-235.100.

Franz, Gerhard: *See—*
Schonfelder, Lothar; and Franz, Gerhard, 4,798,714, Cl. 423-344.000.

Frazer-Nash Limited: *See—*
Griffin, Dennis, 4,798,139, Cl. 102-216.000.

Freeman, Donald C., Jr., to Hancock Jaffe Laboratories. Enhancement of xenogeneic tissue. 4,798,611, Cl. 623-66.000.

Freeman, Michael, to John Waddington PLC. Article feeding devices for labellers. 4,798,648, Cl. 156-542.000.

Freiburghaus, Rene : *See—*
Glaus, Heinrich; Lehmann, Peter; Joehr, Hans; and Freiburghaus, Rene , 4,798,231, Cl. 140-119.000.

French, Richard E.: *See—*
Irvin, Timothy B.; and French, Richard E., 4,798,433, Cl. 350-96.210.

Fresh, Michael J.: *See—*
Nelson, David C.; Fresh, Michael J.; and Mueller, Herbert, 4,798,554, Cl. 446-222.000.

Frick, Roger L.; and Pierce, Dean S., to Rosemount Inc. Isolator apparatus. 4,798,089, Cl. 73-706.000.

Fridland, Anatoly: *See—*
Pearlman, Sheldon; Fridland, Anatoly; and Martin, Gunther J., 4,799,239, Cl. 375-88.000.

Friedman, Robert B.; Gottneid, David J.; Faron, Eugene J.; Pustek, Frank J.; and Katz, Frances R., to American Maize-Products Company. Foodstuffs containing starch of an amylose extender sugary-2 genotype. 4,798,735, Cl. 426-578.000.

Friese, Karl-Hermann: *See—*
Benedikt, Walter; Heess, Gerhard; Herden, Werner; Friese, Karl-Hermann; Reum, Helmut; Schmatz, Jurgen; and Schwab, Siegbert, 4,798,991, Cl. 313-137.000.

Fritz, Bernard S.: *See—*
Wilson, Mark L.; and Fritz, Bernard S., 4,799,210, Cl. 369-110.000.

Fritzsche Dodge & Olcott Inc.: *See—*
Farbood, Mohamad I.; and Willis, Brian J., 4,798,799, Cl. 435-254.000.

Frohlich, Walter: *See—*
Link, Gerhard; Frohlich, Walter; Krumbock, Reinhard; Prantl, Georg; and Schaffelhofer, Iwo, 4,798,914, Cl. 570-226.000.

Fuel Systems Textron Inc.: *See—*
Mancini, Alfred A.; Sager, James W.; and Koblish, Theodore R., 4,798,330, Cl. 239-8.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Sogawa, Yoshiyuki, 4,798,083, Cl. 73-118.200.

Fuji Kagokushi Kogyo Co.: *See—*
Watanabe, Hiroaki, 4,798,490, Cl. 400-697.100.

Fuji Photo Film Co., Ltd.: *See—*
Akimoto, Taizo; Akisada, Masahide; Seiki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,799,072, Cl. 354-76.000.
Asano, Seiji; and Tanaka, Yasuhiko, 4,799,073, Cl. 354-195.120.
Idota, Yoshio; Karino, Yukio; Hayashi, Hiroshi; and Tomiyama, Hideki, 4,798,779, Cl. 430-202.000.
Ishikawa, Takatoshi; Fujimoto, Hiroshi; Ohki, Nobutaka; and Yagihara, Morio, 4,798,783, Cl. 430-372.000.
Kishimoto, Shinzo; Nishikawa, Toshihiro; Abe, Akira; and Nakajima, Junya, 4,798,784, Cl. 430-382.000.
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Nagao, Makoto, 4,799,244, Cl. 377-58.000.
Nagumo, Akihiko; Ishikawa, Minoru; and Kawada, Ken, 4,799,085, Cl. 355-27.000.
Ushiro, Seimei; and Kaneko, Hiromi, 4,799,075, Cl. 354-289.100.
Yamada, Yasuyuki; and Miyatsuka, Hajime, 4,798,755, Cl. 428-141.000.
Yamaguchi, Akira, 4,798,639, Cl. 156-73.100.

Fuji Xerox Co., Ltd.: *See—*
Mori, Ikuo, 4,799,086, Cl. 355-3.0DD.
Saito, Koichi; Akutsu, Eiichi; Fujimura, Yoshihiko; and Inoue, Nanao, 4,799,068, Cl. 346-1.100.

Fujie, Masakatsu: *See—*
Kamejima, Kohji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Yamamoto, Hiroshi, 4,799,267, Cl. 382-1.000.

Fujii, Hiroshi: *See*—
Iio, Tsukasa; Mochizuki, Yoshinori; Fujii, Hiroshi; Genba, Yasusi; and Moriwaki, Hideaki, 4,799,037, Cl. 335-46.000.
Fujii, Noriaki; Kitamura, Mamoru; and Yamada, Akira, to Mitsubishi Denki Kabushiki Kaisha. Plastic package for an IC card. 4,798,946, Cl. 235-492.000.
Fujii, Toshio: *See*—
Hiyamizu, Satoshi; and Fujii, Toshio, 4,799,088, Cl. 357-16.000.
Fujikawa, Tetsuzo; Yamaguchi, Yoichi; and Takahashi, Akira, to Kawasaki Jukogyo Kabushiki Kaisha. Control-display device for an engine-equiped apparatus. 4,798,082, Cl. 73-117.300.
Fujimoto, Hiroshi: *See*—
Ishikawa, Takatoshi; Fujimoto, Hiroshi; Ohki, Nobutaka; and Yagihara, Morio, 4,798,783, Cl. 430-372.000.
Fujimura, Masaki: *See*—
Nagasaki, Yoichi; Nagamoto, Itsushi; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,798,383, Cl. 273-167.00H.
Fujimura, Yoshihiko: *See*—
Saito, Koichi; Akutsu, Eiichi; Fujimura, Yoshihiko; and Inoue, Nanao, 4,799,068, Cl. 346-1.100.
Fujino, Hisami: *See*—
Okada, Reisuke; and Fujino, Hisami, 4,798,762, Cl. 428-285.000.
Fujioka, Tadashi: *See*—
Ujino, Koji; and Fujioka, Tadashi, 4,799,079, Cl. 355-14.0SH.
Fujita, Takayuki; Iwasaki, Yoshiya; and Yabe, Hiroko, to Shikoku Chemicals Corporation. Chemotherapeutant composition. 4,798,844, Cl. 514-399.000.
Fujitsu Limited: *See*—
Arakawa, Hideki, 4,799,194, Cl. 365-154.000.
Fukuma, Hiroyuki; and Sato, Masashi, 4,799,089, Cl. 357-45.000.
Hiyamizu, Satoshi; and Fujii, Toshio, 4,799,088, Cl. 357-16.000.
Inoue, Yoshiyuki; Takahashi, Masaaki; Tatekura, Koichi; Nishikawa, Hitoshi; Ohta, Hajime; and Kogure, Yoshikazu, 4,798,969, Cl. 307-112.000.
Itoh, Hideaki, 4,799,237, Cl. 375-38.000.
Kaku, Takashi, 4,799,214, Cl. 370-32.100.
Kodama, Yukinori; Mochizuki, Hirohiko; Nakano, Masao; Ohira, Tsuyoshi; and Nomura, Hidenori, 4,799,197, Cl. 365-205.000.
Nakamura, Moritaka; and Kurimoto, Takashi, 4,798,650, Cl. 156-643.000.
Ogawa, Junji, 4,799,198, Cl. 365-221.000.
Sugawara, Hideo, 4,799,032, Cl. 333-116.000.
Takemae, Yoshihiro, 4,799,196, Cl. 365-190.000.
Fujitsu VLSI Limited: *See*—
Kodama, Yukinori; Mochizuki, Hirohiko; Nakano, Masao; Ohira, Tsuyoshi; and Nomura, Hidenori, 4,799,197, Cl. 365-205.000.
Fujiwara, Hiroshi, to Olympus Optical Co., Ltd. Binocular tube whose angle of inclination is adjustable. 4,798,451, Cl. 350-522.000.
Fujiwara, Kenichi, to Sumitomo Rubber Industries, Ltd. High performance tire tread. 4,798,236, Cl. 152-209.00R.
Fujiwara, Masahiko; Ajisawa, Akira; and Suzuki, Shuji, to NEC Corporation. Optical switch circuit. 4,798,435, Cl. 350-96.130.
Fujiwara, Masakatsu, to Sanyo Electric Co., Ltd. Electrophotographic copying machine having editorial function. 4,799,080, Cl. 355-7.000.
Fujiwara, Shinobu: *See*—
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,799,127, Cl. 361-321.000.
Fukami, Kashirou: *See*—
Oomura, Seiji; Fukami, Kashirou; Inagaki, Masao; and Hamamoto, Tooru, 4,798,177, Cl. 12.3-41.120.
Fukami, Tadashi; Ozaki, Shinya; and Odaka, Kentaro, to Sony Corporation. Apparatus for reproducing a digital signal. 4,799,221, Cl. 371-38.000.
Fukuma, Hiroyuki; and Sato, Masashi, to Fujitsu Limited. Semiconductor memory device. 4,799,089, Cl. 357-45.000.
Fukumoto, Jay T.: *See*—
Szluk, Nicholas J.; and Fukumoto, Jay T., 4,799,097, Cl. 357-42.000.
Fukushima, Shigeyoshi; Uno, Hidehiro; and Mimura, Shigetoshi, to Toyo Tire & Rubber Company Limited. Laminate structure of interior finishing material. 4,798,756, Cl. 428-198.000.
Fukushima, Yoshihisa: *See*—
Satoh, Isao; Ichinose, Makoto; Fukushima, Yoshihisa; Kuroki, Yuzuru; and Takagi, Yuuji, 4,799,208, Cl. 369-100.000.
Fukuta, Shigemi; Amakasu, Toshinari; Ugata, Ken; and Yoshino, Shoichi, to Kubota Ltd. Process for making a filter for molten metal having a high melting point. 4,798,615, Cl. 65-4.400.
Fullmann, Heinz-Josef: *See*—
Hocker, Jurgen; Rottmaier, Ludwig; Reinking, Klaus; Kirsch, Jurgen; and Fullmann, Heinz-Josef, 4,798,686, Cl. 252-500.000.
Furbee, Avery D.; Perno, Salvatore G.; and Burke, James E., to Picker International, Inc. X-ray tube having multiple cathode filaments. 4,799,248, Cl. 378-114.000.
Furey, Thomas. Nail holding attachment for a hammer. 4,798,107, Cl. 81-23.000.
Furukawa Electric Co., Ltd., The: *See*—
Kojima, Seiji; Ikeda, Masakiyo; Kikuchi, Hiroshi; and Kashiwayanagi, Yuzo, 4,798,743, Cl. 427-255.000.
Furukawa, Kiyoshi: *See*—
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,799,127, Cl. 361-321.000.
Furukawa, Kusuo, to Kawasaki Steel Corporation. Steel sheets for painting and a method of producing the same. 4,798,772, Cl. 428-600.000.
Fushimi, Kimio: *See*—
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Fusion Plastics Limited: *See*—
Kenworthy, David M. A.; Bridgstock, Eric; and Dunkey, Edwin A. W., 4,797,993, Cl. 29-613.000.
Futami, Toru: *See*—
Sakagami, Atsushi; Futami, Toru; Abe, Noriyuki; and Suzuki, Tadashi, 4,799,218, Cl. 370-85.000.
Futrex, Inc.: *See*—
Rosenthal, Robert D., 4,798,955, Cl. 250-341.000.
Gabbay, Emile: *See*—
Penato, Jean M.; Gabbay, Emile; and Debrouwer, Yves, 4,799,250, Cl. 378-144.000.
Gnairdo, Mario, to Microlys S.p.A. Dot matrix print head. 4,798,484, Cl. 400-124.000.
Gain Electronics Corporation: *See*—
Lee, Gary M.; Lee, Charles M.; and LaRue, George S., 4,798,978, Cl. 307-450.000.
Gallina Corporation: *See*—
Nett, Louis, 4,798,939, Cl. 219-438.000.
Gandolfi, Carmelo A.; Spinelli, Silvano; Tofanetti, Odoardo; Russo, Raimondo; and Tognella, Sergio, to Boehringer Biochemia Robin S.p.A. Antitussive and mucus regulating 2-substituted thiazolidines. 4,798,898, Cl. 548-146.000.
Gannon, Raymond, to FGL Projects Limited. Valve and containers incorporating the same. 4,798,324, Cl. 229-125.350.
Ganong, William F., III: *See*—
Feldman, Joel A.; Ganong, William F., III; and Bradner, Scott, 4,799,262, Cl. 381-43.000.
Ganser-Hydromag: *See*—
Ganser, Marco A., 4,798,186, Cl. 123-467.000.
Ganser, Marco A., to Ganser-Hydromag. Fuel injector unit. 4,798,186, Cl. 123-467.000.
Garland, Clifford. International world clock. 4,799,203, Cl. 368-27.000.
Garner, David P.: *See*—
Hetherington, Michael W.; Garner, David P.; and Millman, Allan D., 4,798,613, Cl. 55-52.000.
Garrett, Alfred G. Combination pant and skirt garment. 4,797,955, Cl. 2-213.000.
Gartner, Horst: *See*—
Feldmann, Hugo; Hollmann, Friedrich; Gartner, Horst; and Beisemann, Gerd, 4,798,074, Cl. 72-247.000.
Gas Research Institute: *See*—
Gerstmann, Joseph; Celorier, George M., Jr.; and Hill, Wayne S., 4,798,240, Cl. 165-48.100.
Gasaway, Tommy D.: *See*—
Billinger, Randy J.; Dotter, Laurel K.; and Gasaway, Tommy D., 4,799,255, Cl. 379-189.000.
Gates Rubber Company, The: *See*—
Sedlacek, Douglas R., 4,798,566, Cl. 474-238.000.
Gattermann, Bernd; Steenken, Bernhard; Grosse-Scharmann, Franz; and Muller, Horst, to Amazonen Werke, H. Dreyer GmbH. Co. KG. Combination normal-sowing and fine-sowing wheel with integral stop. 4,798,271, Cl. 192-18.00R.
Gaukel, Gisela: *See*—
Haeussler, Klaus M.; Wittmann, Julius; Gaukel, Gisela; and Auracher, Franz, 4,799,234, Cl. 372-97.000.
Gearhart, Walter S., to United States of America, Navy. Fuel efficient propulsor for outboard motors. 4,798,547, Cl. 440-66.000.
Geary, Carl H., to Elliott Turbomachinery Co., Inc. Particulate collection and cooling in a turbomachine. 4,798,047, Cl. 60-39.092.
Gebruder Junghans GmbH: *See*—
Winterhalter, Walter; and Halsnig, Andreas, 4,798,140, Cl. 102-251.000.
Geco A.S.: *See*—
Langeland, Jan-Age; Gjestrum, Einar; and Bjerkoy, Rolf, 4,798,156, Cl. 114-242.000.
Gehrung, Hartmut; Krastel, Hermann; and Kirchhuebel, Rainer, to Oculus Optikgeraete GmbH. Anomaloscope. 4,798,458, Cl. 351-242.000.
Geisler, Robert A.: *See*—
Lakshmanan, Vaikuntam I.; Melnbardis, Dzinsars; and Geisler, Robert A., 4,798,709, Cl. 423-63.000.
Geisseler, Max, to Sulzer Brothers Limited. Process for producing a weld-built member. 4,798,930, Cl. 219-76.120.
Genba, Yasusi: *See*—
Iio, Tsukasa; Mochizuki, Yoshinori; Fujii, Hiroshi; Genba, Yasusi; and Moriwaki, Hideaki, 4,799,037, Cl. 335-46.000.
Genentech, Inc.: *See*—
Mason, Anthony J.; and Seeburg, Peter H., 4,798,885, Cl. 530-350.000.
General Electric Company: *See*—
Abuaf, Nesim; Barito, Robert W.; and Downs, Kenneth L., 4,798,753, Cl. 428-69.000.
Armstrong, William J.; and Stich, Richard A., 4,798,425, Cl. 312-328.000.
Baliga, Bantval J., 4,799,095, Cl. 357-38.000.
Briggs, Milton; and Teutsch, Erich O., 4,798,526, Cl. 425-113.000.
Gilliard, Richard P.; Cap, Daniel M.; and Russell, Timothy D., 4,798,995, Cl. 313-638.000.
Maresca, Louis M.; Clagett, Donald C.; and Wascher, Uwe S., 4,798,874, Cl. 525-425.000.
McCready, Russell J.; Liu, Nan-I; and Tyrell, John A., 4,798,858, Cl. 524-100.000.

Near, Timothy P.; Cieri, Joseph J.; and Holet, Kenneth M., 4,799,052, Cl. 340-825.500.
Rezvani, Behrooz, 4,799,016, Cl. 324-318.000.
van Raalte, John A., 4,798,448, Cl. 350-345.000.
General Electric Company, p.l.c., The: *See*—
Baxter, Ivor R., 4,798,947, Cl. 250-201.000.
General Felt Industries, Inc.: *See*—
Napoleon, David P.; and Centofanti, Salvatore J., 4,797,977, Cl. 19-97.000.
General Foods Corporation: *See*—
Scoville, Eugene; Turek, Evan J.; Wragg, Anthony; Cuozzo, Karlisa D.; and Rankowitz, Marshall M., 4,798,730, Cl. 426-432.000.
General Instrument Corporation: *See*—
Silverman, Lawrence H.; Teague, Randy; and Kaminsky, Richard, 4,799,034, Cl. 333-202.000.
General Machine Design, Inc.: *See*—
Cornacchia, Vincent, 4,798,278, Cl. 198-399.000.
General Motors Corporation: *See*—
Benedict, Robert B., 4,798,564, Cl. 474-134.000.
Buschur, Jeffrey J.; Paulick, David R.; and Schoen, Roy C., 4,798,102, Cl. 74-600.000.
Farrell, Robert C., 4,798,560, Cl. 464-178.000.
Giacomazzi, Roy A.; and Giampa, Rolland D., 4,798,306, Cl. 220-86.00R.
Kia, Hamid G., 4,798,763, Cl. 428-285.000.
Staub, Vincent M., Jr., 4,798,129, Cl. 92-128.000.
General Signal Corporation: *See*—
Rojecki, Walter E., 4,798,420, Cl. 303-38.000.
Genex Corporation: *See*—
Anderson, David M.; and McGuire, Jeffrey C., 4,798,791, Cl. 435-68.000.
Geno, Wayne H.; and Weitzenhof, David A., to Firestone Tire & Rubber Company, The. Ultrasonic air spring system. 4,798,369, Cl. 269-64.110.
Genth, Hermann: *See*—
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Reinecke, Paul; Hansler, Gerd; and Brandes, Wilhelm, 4,798,905, Cl. 560-16.000.
Gentles, David G.; and Gentles, Mary A. Animated toys. 4,798,553, Cl. 446-99.000.
Gentles, Mary A.: *See*—
Gentles, David G.; and Gentles, Mary A., 4,798,553, Cl. 446-99.000.
Georg Fischer Aktiengesellschaft: *See*—
Greulich, Walter; Gut, Karl; Hornung, Klaus; and Schulte, Guther, 4,798,178, Cl. 123-90.600.
Kempf, Helmut; and Kopp, Hans, 4,798,418, Cl. 301-31.000.
George, Albert L.; and Gooch, Don. System for harvesting crawfish. 4,798,020, Cl. 43-6.500.
George, Gary P., to Stout Industries, Inc. Double pole spanner display. 4,798,031, Cl. 52-309.110.
Geoservices, Societe Anonyme: *See*—
Issenmann, Olivier, 4,798,805, Cl. 436-157.000.
Gerber Scientific Products, Inc.: *See*—
Wood, Kenneth O.; and Logan, David J., 4,799,172, Cl. 364-518.000.
Gerhartz, Siegmar: *See*—
Schippers, Heinz; and Gerhartz, Siegmar, 4,798,347, Cl. 242-18.00R.
Gerner, Rudolf, to KAPPA messtechnik GmbH. Method of recording and storing images in rapid sequence. 4,799,108, Cl. 358-213.260.
Gerstmann, Joseph; Celorier, George M., Jr.; and Hill, Wayne S., to Gas Research Institute. Integrated space heating, air conditioning and potable water heating appliance. 4,798,240, Cl. 165-48.100.
Getty, Edward E.: *See*—
Drago, Russell S.; and Getty, Edward E., 4,798,667, Cl. 208-117.000.
Geuze, Maarten M.: *See*—
Brons, Henricus M. J.; and Geuze, Maarten M., 4,798,884, Cl. 528-491.000.
Ghiraldi, Alberto, to D.S.D.P. - S.p.A. Shelter for thermally conditioning electronic appliances. 4,798,238, Cl. 165-32.000.
Ghosh, Asim; and Toukmanian, Aram H., to Carling O'Keefe Breweries of Canada Limited. Bottle with integral cap-removing recess. 4,798,300, Cl. 215-10.000.
Giacomazzi, Roy A.; and Giampa, Rolland D., to General Motors Corporation. Fuel tank venting. 4,798,306, Cl. 220-86.00R.
Giampa, Rolland D.: *See*—
Giacomazzi, Roy A.; and Giampa, Rolland D., 4,798,306, Cl. 220-86.00R.
Gibas, Daniel F., to Ivan's Idiosyncrasy, Inc. Slack adjuster lubricator and methods of use. 4,798,265, Cl. 184-105.100.
Gibbs, James D.: *See*—
Dumoncseaux, Gary W.; Weber, Edwin R.; and Gibbs, James D., 4,798,551, Cl. 441-130.000.
Gibson, Michael R.: *See*—
Yoe, Craig S.; Gibson, Michael R.; O'Patka, Dennis J.; and Kuna, Wayne A., 4,798,455, Cl. 351-51.000.
Giesy, Jerry D.; Hermann, George D.; and Hoskins, Matthew W., to Fogarty, Thomas J. Protective sheath instrument carrier. 4,798,193, Cl. 128-7.000.
Gillette Company, The: *See*—
Packham, Charles C.; White, Robert; and Rogers, Steven, 4,797,997, Cl. 30-43.920.
Gilliard, Richard P.; Cap, Daniel M.; and Russell, Timothy D., to General Electric Company. Metal halide lamp containing halide composition to control arc tube performance. 4,798,995, Cl. 313-638.000.
Gillis, Herbert R., Jr., to ICI Americas Inc. Polyureas prepared from a mixture of polyamines and polyisocyanate. 4,798,862, Cl. 524-783.000.
Gimple, James J., to DeVilbiss Company, The. Spray gun for robot mounting. 4,798,341, Cl. 239-694.000.
Giolma, William H.: *See*—
Haight, Michael H.; and Giolma, William H., 4,799,030, Cl. 331-117.00R.
Morgan, John D.; Giolma, William H.; and Boucher, Richard, 4,798,973, Cl. 307-296.00R.
Giotis, George A. Traffic directing sign. 4,798,017, Cl. 40-612.000.
Girard, Jean-Michel, to A.N.F. Industrie. Device for intercommunication between coupled vehicles in which passengers can walk freely, especially railway cars or road vehicles. 4,798,148, Cl. 105-17.000.
Gisler, Barbara; and Tomasi, Werner, to Wretschitsch, Walter, a part interest. Wind instrument and process of making same. 4,798,122, Cl. 84-385.00P.
Giuliani, Marcello. Multiple-card with transferring, carding and cleaning cylinder. 4,797,978, Cl. 19-98.000.
Gjertsen, Robert K.: *See*—
Cerni, Samuel; Wilson, John F.; and Gjertsen, Robert K., 4,798,699, Cl. 376-327.000.
Gjestrum, Einar: *See*—
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Glaser, Jerry; and Elpern, David G., to Allied-Signal Inc. Turbocharger bearing and lubrication system. 4,798,523, Cl. 417-407.000.
Glaus, Heinrich; Lehmann, Peter; Joehr, Hans; and Freiburghaus, Rene , to Styner & Bienz AG. Method and device for connecting at least two rods. 4,798,231, Cl. 140-119.000.
Glen, John B.; and James, Roger, to Imperial Chemical Industries PLC. Pharmaceutical compositions. 4,798,846, Cl. 514-731.000.
Globig, Michael A.: *See*—
Wyeth, Richard W.; Johnson, Michael A.; and Globig, Michael A., 4,798,467, Cl. 356-349.000.
Goedker, Joseph L.: *See*—
Lipinski, Thomas L.; and Goedker, Joseph L., 4,798,062, Cl. 62-381.000.
Goel, Anil B.; and Chang, Biau-Hung, to Ashland Oil, Inc. Alkylene phosphonate acid ester polyols. 4,798,872, Cl. 558-186.000.
Goel, Anil B., to Ashland Oil, Inc. Novel poly(arylene ether-amide) polyols and their application in polyurethane polymers. 4,798,881, Cl. 528-73.000.
Goeller, Loretta: *See*—
Taylor, David C.; Springer, William E.; Goeller, Loretta; and Santhouse, Daniel, 4,799,124, Cl. 361-42.000.
Goldstein, Gideon: *See*—
Kung, Patrick C.; and Goldstein, Gideon, 4,798,806, Cl. 436-548.000.
Goldstein, Guy; and Pierre, Michel, to Beghin-Say S.A. Fixation of polymers retaining liquids in a porous structure. 4,798,744, Cl. 427-389.900.
Gollinger, Franz X.; and Bock, Georg, to M.A.N.-Roland Druckmaschinen AG. Multi-liquid control valve system, particularly for flexographic ink of different colors. 4,798,228, Cl. 137-625.470.
Gonda, Tsunemi: *See*—
Morohashi, Kazuo; Miyake, Nobuyuki; and Gonda, Tsunemi, 4,798,457, Cl. 351-235.000.
Gooch, Don: *See*—
George, Albert L.; and Gooch, Don, 4,798,020, Cl. 43-6.500.
Goode, Barry L., to Air Plus, Inc. Closed loop feedback air supply for air support beds. 4,797,962, Cl. 5-453.000.
Goodwin, Vernon L., to SSI Medical Services, Inc. Valve for a patient support structure. 4,798,227, Cl. 137-554.000.
Goodyear Tire & Rubber Company, The: *See*—
Tung, William C. T.; and Floyd, Merry E., 4,798,883, Cl. 528-272.000.
Goor, Daniel; Mohr, Raphael; Haddad, Ihsan A.; and Oliver, William R. Diagnostic methods and apparatus employing monitoring of myocardial ischemia. 4,798,211, Cl. 128-668.000.
Gordon, Eric M.: *See*—
Delaney, Norma G.; Gordon, Eric M.; and Ondetti, Miguel A., 4,798,904, Cl. 558-254.000.
Gordon, Kenneth A.: *See*—
Jorgensen, Allen R.; Belongia, Larry P.; Gordon, Kenneth A.; and La Haye, John L., 4,798,350, Cl. 242-64.000.
Gorner, Horst; and Dyma, Horst, to Mannesmann Kienzle GmbH. Document encoding device with document reading station and document viewing station. 4,798,944, Cl. 235-475.000.
Gorres, Dieter: *See*—
Fleischer, Hans-Joachim; Lohscheidt, Klaus; Gorres, Dieter; and Behr, Friedrich, 4,798,631, Cl. 148-3.000.
Goshima, Takahiro; Hattori, Yoshiyuki; Kinbara, Hiroji; Otsuki, Hiromi; Nomura, Yoshihisa; and Nakanishi, Nobuyasu, to Nippondenso Co., Ltd.; and Jidosha Kabushiki Kaisha. Accumulator. 4,799,048, Cl. 340-626.000.
Gosmann, Martin: *See*—
Franck, Burchard; and Gosmann, Martin, 4,798,891, Cl. 540-472.000.
Goss, Gary J.; Hirsch, Thomas S.; and Holtey, Thomas O., to Honeywell Bull Inc. Facility for passing data used by one operating system to a replacement operating system. 4,799,145, Cl. 364-200.000.

Goto, Toshio: *See*—
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; and Yagi, Shigeki, 4,798,620, Cl. 71-95.000.
Gotthardt, Gerhard R.: *See*—
Maddison, David S.; Skalsky, Michael; Milijasevic, Zoran; Perry, Stephen G.; Holley, Loraine K.; Gotthardt, Gerhard R.; and Richardson, Garry T., 4,798,206, Cl. 128-419.00P.
Gottlieb, Ellis J.: *See*—
Chilluffo, Ronald L.; and Gottlieb, Ellis J., 4,799,035, Cl. 333-223.000.
Gottlieb Roll GmbH & Co.: *See*—
Eylers, Dieter; and Bamberger, Hans, 4,797,982, Cl. 24-11.00R.
Gottneid, David J.: *See*—
Friedman, Robert B.; Gottneid, David J.; Faron, Eugene J.; Pustek, Frank J.; and Katz, Frances R., 4,798,735, Cl. 426-578.000.
Goubeaux, Eugene F., Jr.: *See*—
Vicars, Paul D.; Hendricks, Roy J.; and Goubeaux, Eugene F., Jr., 4,798,556, Cl. 446-391.000.
Goudie, Kathleen M.: *See*—
Lin, Kun-Shan; and Goudie, Kathleen M., 4,799,261, Cl. 381-36.000.
Gould, Francis E.; Morgan, Ellen K.; and Reduker, Stephen D., to Tyndale Plains-Hunter Ltd. Hydrophilic polyurethane composition. 4,798,876, Cl. 525-457.000.
Gould Inc.: *See*—
Moore, Douglas; and Marcus, Mark E., 4,798,438, Cl. 350-96.150.
Graham, Douglas. Gas dispensing projectile. 4,798,143, Cl. 102-370.000.
Graham Engineering Corporation: *See*—
Briggs, Milton; and Teutsch, Erich O., 4,798,526, Cl. 425-113.000.
Graham, James H.: *See*—
Michaud, Gerard H.; Graham, James H.; and Stout, Roger P., 4,797,994, Cl. 29-720.000.
Grant, Thomas S.; Jalbert, Ronald L.; and Whalen, David, to Borg-Warner Chemicals, Inc. Thermoplastic polyamide—polyphenylene ether compositions. 4,798,865, Cl. 525-92.000.
Grass Valley Group, Inc., The: *See*—
La Barge, Steven B.; and Stanger, Leon J., 4,799,026, Cl. 330-254.000.
Grasl, Hans P., to Siemens Aktiengesellschaft. Convolver arangement with acoustic waves. 4,799,184, Cl. 364-821.000.
Gravely, Charles T., to J & S Electronics, Inc. Apparatus for controlling device start up and off/on running periods. 4,798,971, Cl. 307-141.000.
Graves, Ernest D., Jr.: *See*—
Wolcott, Duane K.; Graves, Ernest D., Jr.; and Hunt, David G., 4,798,803, Cl. 436-52.000.
Great Lakes Orthodontic Laboratories Inc.: *See*—
Breads, Peter R., 4,798,534, Cl. 433-6.000.
Greenlee, Thomas W.: *See*—
Hannah, Steven L.; Williams, Maureen R.; and Greenlee, Thomas W., 4,798,879, Cl. 528-45.000.
Greenwood, Darryl P.: *See*—
Rediker, Robert H.; Leonberger, Frederick J.; and Greenwood, Darryl P., 4,798,437, Cl. 350-96.140.
Gregory, Charles. Hot gas defrost system for refrigeration systems and apparatus therefor. 4,798,058, Cl. 62-278.000.
Greig, Walter G., to Moore Business Forms, Inc. Multiple copy note pad. 4,798,401, Cl. 282-9.00R.
Grendahl, Dennis T. Laminated zone of focus artificial lens. 4,798,608, Cl. 623-6.000.
Grendahl, Dennis T. Radially segmented zone of focus artificial lens. 4,798,609, Cl. 623-6.000.
Greulich, Walter; Gut, Karl; Hornung, Klaus; and Schulte, Guther, to Georg Fischer Aktiengesellschaft. Compound camshaft and method of manufacturing the same. 4,798,178, Cl. 123-90.600.
Griffin, Dennis, to Frazer-Nash Limited. Solenoid-operated devices. 4,798,139, Cl. 102-216.000.
Griffin, Evans E.: *See*—
Zipps, Robert H.; Lyons, Kent A.; and Griffin, Evans E., 4,798,519, Cl. 416-191.000.
Griffith, Ronald C.; and Napier, James J., to Pennwalt Corporation. 2-amino-n-[1,2-diphenyl-1-(thifluoromethyl)ethyl]acetamide. 4,798,687, Cl. 260-501.100.
Grill, Thomas M.: *See*—
Bernstein, Howard L.; Grill, Thomas M.; and Silver, Ronald, 4,798,322, Cl. 235-487.000.
Grimm, Hans, to Maschinenfabrik Gehring Gesellshaft mit beschrankter Haftung & Co. Kommanditgesellschaft. Method and apparatus for deburring the inner edge of part of a workpiece. 4,798,024, Cl. 51-33.00R.
Grina, Larry D.: *See*—
Liu, Christopher S.; Grina, Larry D.; and Kapuscinski, Maria M., 4,798,678, Cl. 252-50.000.
Grindahl, Mervin L.; and Denzene, Quentin S., to EnScan, Inc. Automatic/remote RF instrument monitoring system. 4,799,059, Cl. 340-870.030.
Grobben, Henri M., to U.S. Philips Corporation. Clamping device for clamping an optical disc onto a drive spindle. 4,799,209, Cl. 369-75.200.
Grossbach, Rudolf: *See*—
Lierke, Ernst-Gunter; Grossbach, Rudolf; Heide, Wolfgang; Flogel, Karl; and Junger, Martin, 4,798,332, Cl. 239-102.200.
Grosse-Scharmann, Franz: *See*—
Gattermann, Bernd; Steenken, Bernhard; Grosse-Scharmann, Franz; and Muller, Horst, 4,798,271, Cl. 192-18.00R.
Grossmann, Horst; and Staas, Ernst, to Black & Decker Inc. Saw blade for a saw having reciprocating blades. 4,798,001, Cl. 30-355.000.
Grover, R. Kent, to Motorola, Inc. Resynthesized digital radio frequency memory. 4,799,189, Cl. 364-900.000.
Groves, Michael H.; Redshaw, Digby R.; and Cane, Michael R., to Imperial Chemical Industries plc. System for introducing flowable additive into a closed container. 4,798,287, Cl. 206-219.000.
Gruest, Jacqueline: *See*—
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Grumman Aerospace Corporation: *See*—
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Nielsen, Robert E., 4,799,220, Cl. 371-25.000.
Gruteser, Helmut: *See*—
Wittkopp, Helmut; Gruteser, Helmut; Coenen, Wilfred; and Elschenbroich, Walter, 4,798,963, Cl. 250-560.000.
Gsell, Laurenz; and Ackermann, Peter, to Ciba-Geigy Corporation. Substituted phenoxybenzyl-(Dihalodimethylcyclopropyl-methyl)ethers. 4,798,912, Cl. 568-637.000.
GTE Products Corporation: *See*—
Cheresnowsky, Michael J., 4,798,623, Cl. 75-0.5AA.
Ladd, Judith A.; and Miller, Michael J., 4,798,708, Cl. 423-55.000.
GTE Telecomunicazioni, S.p.A.: *See*—
Bottacchi, Stefano; and Ouelladore, Mauro, 4,799,224, Cl. 372-38.000.
Guerrero, Raul. Warmer plate cover. 4,798,937, Cl. 219-433.000.
Gulino, Roy. Carpet finishing tool. 4,797,963, Cl. 7-103.000.
Gunda, Rajamouli, to Vickers, Incorporated. Control system for injection molding machine. 4,798,527, Cl. 425-145.000.
Gunther, Daniel: *See*—
Viaud, Jean; and Gunther, Daniel, 4,798,044, Cl. 56-341.000.
Gustafson, Bruce L.: *See*—
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Gut, Karl: *See*—
Greulich, Walter; Gut, Karl; Hornung, Klaus; and Schulte, Guther, 4,798,178, Cl. 123-90.600.
Guth Lighting Systems, Inc.: *See*—
Molnar, John P., 4,799,136, Cl. 362-300.000.
Guttag, Karl: *See*—
Van Aken, Jerry; and Guttag, Karl, 4,799,053, Cl. 340-703.000.
Guzzini, Virgilio, to Teuco Guzzini S.r.l. Bathtub with improved hydromassage system. 4,797,958, Cl. 4-542.000.
Haas, Dave; VanderSyde, Gary; Beatty, Paul; and Roxas, Ren, to Bell & Howell Company. Insertion machine. 4,798,040, Cl. 53-460.000.
Haas, Herbert G. Releasable mounting assembly for tire building drum. 4,798,647, Cl. 156-414.000.
Haas, Michael W., to United States of America, Air Force. Stimulator for eye tracking oculometer. 4,798,214, Cl. 128-745.000.
Hacegawa, Toshiyuki: *See*—
Azuma, Toshiro; and Hacegawa, Toshiyuki, 4,798,259, Cl. 180-233.000.
Haddad, Ihsan A.: *See*—
Goor, Daniel; Mohr, Raphael; Haddad, Ihsan A.; and Oliver, William R., 4,798,211, Cl. 128-668.000.
Haeg, Steven R.; and Krasbel, Mark T., to MTS Systems Corporation. Vehicle restraint system. 4,798,088, Cl. 73-669.000.
Haeussler, Klaus M.; Wittmann, Julius; Gaukel, Gisela; and Auracher, Franz, to Siemens Aktiengesellschaft. Laser transmitter including an external optical resonator. 4,799,234, Cl. 372-97.000.
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Workum, Donald J., 4,798,311, Cl. 222-131.000.
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Haglof, Ingvar. Thread measuring device. 4,798,003, Cl. 33-134.00R.
Hagmann, Walter: *See*—
Braun, Walter; and Hagmann, Walter, 4,799,238, Cl. 375-56.000.
Hahn, Klaus-Juergen: *See*—
Lehmann, Hans D.; Kretzschmar, Rolf; and Hahn, Klaus-Juergen, 4,798,811, Cl. 514-159.000.
Haidon Industrial Co., Ltd.: *See*—
Cho, Sung C., 4,798,357, Cl. 248-96.000.
Haight, Michael H.; and Giolma, William H., to Texas Instruments Incorporated. Voltage controlled oscillator clamp circuit. 4,799,030, Cl. 331-117.00R.
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Prugh, John D.; Hartman, George D.; and Halczenko, Wasyl, 4,798,831, Cl. 514-253.000.
Hale, John G.: *See*—
Humbach, Michael J.; and Hale, John G., 4,798,665, Cl. 208-61.000.
Hall, Kevin P.; and Mott, Andrew W., to Minnesota Mining and Manufacturing Company. Silver halide photographic light-sensitive systems comprising a hydrazine which contains a group undergoing a cyclization reactionupon cleavage from the hydrazine. 4,798,780, Cl. 430-264.000.
Hallberg, Carl R., to A/S Platon. Device for stabilizing bulk material. 4,798,498, Cl. 405-258.000.
Halsig, Andreas: *See*—
Winterhalter, Walter; and Halsig, Andreas, 4,798,140, Cl. 102-251.000.
Halter, Hartmut; Zimmermann, Paul H.; and Achterwinter, Norbert, to Reifenhauser GmbH & Co. Maschinenfabrik. Apparatus for coiling a

foil web, especially a synthetic resin foil web. 4,798,351, Cl. 242-65.000.

Hamada, Shuji, to Niigata Engineering Co., Ltd. Method of and apparatus for sandblasting workpiece. 4,798,027, Cl. 51-310.000.

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Sugata, Hiroyuki; Nakata, Kouhei; Mizusawa, Nobutoshi; Yuasa, Satoshi; Haruta, Masahiro; Hamamoto, Takashi; and Osabe, Kuniji, 4,798,694, Cl. 264-60.000.

Hamamoto, Tooru: *See*—
Oomura, Seiji; Fukami, Kashirou; Inagaki, Masao; and Hamamoto, Tooru, 4,798,177, Cl. 12.3-41.120.

Hamil, Henry F.: *See*—
Lyle, Robert E., Jr.; and Hamil, Henry F., 4,798,870, Cl. 525-327.100.

Hanawa, Masatoshi, to Kabushiki Kaishi Toshiba. Magnetic resonance imaging system. 4,799,012, Cl. 324-309.000.

Hancock Jaffe Laboratories: *See*—
Freeman, Donald C., Jr., 4,798,611, Cl. 623-66.000.

Hancock, John C.; Dubrul, William R.; and Heyler, Charles J., III, to McGhan Medical Corporation. Self-sealing injection reservoir. 4,798,584, Cl. 604-93.000.

Handlin, Dale L., Jr., to Shell Oil Company. Kraton G thermoplastic elastomer gel filling composition for cables. 4,798,853, Cl. 523-173.000.

Hands, Godfrey: *See*—
Bayer, Antonius L.; Bles, Bernhardus A. L.; Hands, Godfrey; and Hovden, Dag A., 4,798,299, Cl. 212-157.000.

Handwerk, Hans-Peter: *See*—
Ritter, Wolfgang; Handwerk, Hans-Peter; Schlueter, Kaspar; and Hassenjuergen, Heinz, 4,797,964, Cl. 8-115.600.

Handwerk, Volker: *See*—
Knothe, Erich; Maaz, Gunther; and Handwerk, Volker, 4,798,252, Cl. 177-245.000.

Hann, J. David; Holdahl, Theodore S.; and Lum, James C. P., to Telenet Communications Corporation. Method and apparatus for enhancing security of communications in a packet-switched data communications system. 4,799,153, Cl. 364-200.000.

Hanna, Daniel C. Front, top and rear applicator for a vehicle wash. 4,798,217, Cl. 134-57.00R.

Hanna, Junichi: *See*—
Hirooka, Masaaki; Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, 4,798,166, Cl. 118-719.000.
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Hannah, Steven L.; Williams, Maureen R.; and Greenlee, Thomas W., to B.F. Goodrich Company, The. Catalyzed fast cure polyurethane sealant composition. 4,798,879, Cl. 528-45.000.

Hanssler, Gerd: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,798,899, Cl. 548-262.000.
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Reinecke, Paul; Hanssler, Gerd; and Brandes, Wilhelm, 4,798,905, Cl. 560-16.000.

Hanya, Masao: *See*—
Kitaoka, Seiya; and Hanya, Masao, 4,799,204, Cl. 368-263.000.

Hara, Toshitami: *See*—
Miyazawa, Seiichi; Hara, Toshitami; Nojiri, Hidetoshi; Sekiguchi, Yoshinobu; Hasegawa, Mitsutoshi; and Ikeda, Sotomitsu, 4,799,229, Cl. 372-50.000.

Harada, Yoshihito: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,799,074, Cl. 354-173.100.

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Harder, Patricia A.; and Kunz, Daniel A., to Du Pont de Nemours, E. I., and Company. Bacterial hydroxylation of codeine. 4,798,792, Cl. 435-119.000.

Harding, Robert L.: *See*—
Spadafora, Peter J.; Hersberger, Jill G.; Bell, Myron H.; and Harding, Robert L., 4,799,178, Cl. 364-565.000.

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Drusinsky, Doron; and Harel, David, 4,799,141, Cl. 364-141.000.

Hargis, Duane C., to Ethyl Corporation. Gem cyclodialkylation of amines and amides. 4,798,894, Cl. 544-277.000.

Harmon, Raymond E.; McCown, William R. E.; and Zankich, Frank A., to Rexnord Inc. Adjustable latching mechanism. 4,798,408, Cl. 292-341.180.

Harper-Wyman Company: *See*—
Cacciatore, Joseph J., 4,799,176, Cl. 364-557.000.

Harrington, Max G., to New West Engineering, Ltd. Apparatus for spraying a liquid in a vessel. 4,798,334, Cl. 239-227.000.

Harris, Robert F.: *See*—
Hoffman, Dwight K.; Harris, Robert F.; and Hickner, Richard A., 4,798,877, Cl. 525-531.000.

Hartman, George D.: *See*—
Prugh, John D.; Hartman, George D.; and Halczenko, Wasyl, 4,798,831, Cl. 514-253.000.

Hartman, John, to Minnesota Mining and Manufacturing Company. Low profile clip connector with integral contact support insert. 4,798,544, Cl. 439-404.000.

Hartmann, John F., to Merck & Co., Inc. Antihypertensive therapy for diabetics. 4,798,821, Cl. 514-9.000.

Hartnett, Thomas J., Jr.: *See*—
O'Leary, William J.; Hartnett, Thomas J., Jr.; and Jones, Richard G., 4,798,590, Cl. 604-153.000.

Haruta, Masahiro: *See*—
Sugata, Hiroyuki; Nakata, Kouhei; Mizusawa, Nobutoshi; Yuasa, Satoshi; Haruta, Masahiro; Hamamoto, Takashi; and Osabe, Kuniji, 4,798,694, Cl. 264-60.000.

Harvard Sports, Inc.: *See*—
Dadbeh, Bemanali H., 4,798,381, Cl. 273-1.50R.

Harvey, David H. C.; and Menelaus, Ian G., to Stabilad Limited. Ladder stabilizer. 4,798,263, Cl. 182-107.000.

Harwood, Vance R.: *See*—
Firooz, Kamran; Harwood, Vance R.; Illick, Robert C., Jr.; and Crook, David T., 4,799,023, Cl. 328-110.000.

Hasegawa, Mitsutoshi: *See*—
Miyazawa, Seiichi; Hara, Toshitami; Nojiri, Hidetoshi; Sekiguchi, Yoshinobu; Hasegawa, Mitsutoshi; and Ikeda, Sotomitsu, 4,799,229, Cl. 372-50.000.

Haskins, David R.: *See*—
Knavish, Leonard A.; and Haskins, David R., 4,798,616, Cl. 65-135.000.

Haslbeck, John L.: *See*—
Neal, Lewis G.; Haslbeck, John L.; and Tseng, Hsiaopin, 4,798,711, Cl. 423-239.000.

Hassenjuergen, Heinz: *See*—
Ritter, Wolfgang; Handwerk, Hans-Peter; Schlueter, Kaspar; and Hassenjuergen, Heinz, 4,797,964, Cl. 8-115.600.

Hatakoshi, Gen-ichi: *See*—
Nagasaka, Hiroko; Hatakoshi, Gen-ichi; Shimada, Naohiro; Yamamoto, Motoyuki; Okajima, Masaki; Iizuka, Yoshio; Kawata, Hatsumi; Kinoshita, Hideaki; and Matsuura, Nobuyuki, 4,799,228, Cl. 372-46.000.

Hatanaka, Masahiko, to Kabushiki Kaishi Toshiba. Method for detecting and processing magnetic resonance signals. 4,799,013, Cl. 324-312.000.

Hataura, Kiyoshi; and Nagahama, Masahiro, to Kubota Ltd. Swirl chamber type combustion chamber for diesel engine. 4,798,183, Cl. 123-279.000.

Hatch, Wayne L.: *See*—
Bullock, Joseph J.; Hatch, Wayne L.; and Tackles, George, 4,798,301, Cl. 215-256.000.

Hattori, Etsuo; Iwami, Tomoyuki; Miyazaki, Yoshihiro; and Ohbuchi, Ryutaroh, to International Business Machines Corporation. Display system having extended raster operation circuitry. 4,799,056, Cl. 340-799.000.

Hattori, Isao; and Noiri, Hifuo, to NGK Insulators, Ltd. Extruding die . structure for plunger molding machine. 4,798,528, Cl. 425-190.000.

Hattori, Katsuhiko; Suzuki, Hideyuki; and Ogasawara, Takeo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Hydraulic control apparatus for stepless transmission. 4,798,561, Cl. 474-28.000.

Hattori, Masayuki: *See*—
Kasai, Kiyoshi; Hattori, Masayuki; Takeuchi, Hiromi; and Sakurai, Nobuo, 4,798,691, Cl. 264-47.000.

Hattori, Shigenori; and Yamaguchi, Koshiro, to Brother Kogyo Kabushiki Kaisha. Thermal printer having ribbon take-up mechanism utilizing carriage movement. 4,798,487, Cl. 400-223.000.

Hattori, Takemi: *See*—
Tanino, Masaharu; and Hattori, Takemi, 4,798,415, Cl. 297-410.000.

Hattori, Yoshiyuki: *See*—
Goshima, Takahiro; Hattori, Yoshiyuki; Kinbara, Hiroji; Otsuki, Hiromi; Nomura, Yoshihisa; and Nakanishi, Nobuyasu, 4,799,048, Cl. 340-626.000.

Hauze, Dennis R., to BioMedical Laser Industries. Sterilization, storage, and presentation container for surgical instruments. 4,798,292, Cl. 206-439.000.

Haws, Spencer K., to Alternative Energy Resources, Inc. Automatic hot water recovery apparatus. 4,798,224, Cl. 137-337.000.

Hayakawa, Hideki: *See*—
Shinkawa, Kiyoshi; Kawahara, Takeshi; Hayakawa, Hideki; and Mori, Masaru, 4,799,162, Cl. 364-436.000.

Hayama, Koh, to Minolta Camera Kabushiki Kaisha. Camera with shutter actuated by piezoelectric element and flash light emitting means. 4,799,078, Cl. 354-412.000.

Hayashi, Hiroshi: *See*—
Idota, Yoshio; Karino, Yukio; Hayashi, Hiroshi; and Tomiyama, Hideki, 4,798,779, Cl. 430-202.000.

Hayashi, Osamu; Matsuda, Sadamu; Takahashi, Ichiro; Okamoto, Goro; and Okahashi, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Electrode supporting conduit tube for electrical heating of underground hydrocarbon resources. 4,798,769, Cl. 428-460.000.

Haynes, Denver J.: *See*—
Brunton, Ellis W.; Haynes, Denver J.; and Ross, William M., Jr., 4,798,737, Cl. 426-602.000.

Hayward Industries, Inc.: *See*—
Treene, William E., 4,798,670, Cl. 210-169.000.

Hazlitt, Lonnie G.; and Moldovan, Daniel G., to Dow Chemical Company, The. High temperature continuous viscometry coupled with analytic temperature rising elution fractionation for evaluating crystalline and semi-crystalline polymers. 4,798,081, Cl. 73-53.000.

He, Guo: *See*—
Chuang, Henry Y. H.; and He, Guo, 4,799,152, Cl. 364-200.000.

Heat Transfer Technology Ltd. (Jersey): *See*—
Tozer, Michael J. C., 4,798,392, Cl. 277-200.000.

Heath, Gary B.; Palsulich, William G.; Manica, Keith J.; and Swan, Jack C., Jr., to Cobe Laboratories, Inc. Apparatus for use with fluid flow transfer device. 4,798,090, Cl. 73-715.000.

Hebber, K. Prakash: *See*—
Dart, Peter J.; and Hebber, K. Prakash, 4,798,723, Cl. 424-93.000.
Heess, Gerhard: *See*—
Benedikt, Walter; Heess, Gerhard; Herden, Werner; Friese, Karl-Hermann; Reum, Helmut; Schmatz, Jurgen; and Schwab, Siegbert, 4,798,991, Cl. 313-137.000.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Curable amidoalkylaromatic compositions. 4,798,908, Cl. 564-153.000.
Hegri, B.V.: *See*—
Aronsson, Jan U., 4,798,117, Cl. 83-870.000.
Heide, Wolfgang: *See*—
Lierke, Ernst-Gunter; Grossbach, Rudolf; Heide, Wolfgang; Flogel, Karl; and Junger, Martin, 4,798,332, Cl. 239-102.200.
Heim, Ulrich; and Albarda, Scato, to Dragerwerk Aktiengesellschaft. Arrangement for controlling a vaporizer by means of pressure fluctuations. 4,798,689, Cl. 261-39.100.
Heinen, Raymond, to Leybold-heraeus GmbH. Method and circuit for detecting and monitoring the temperature of a winding. 4,799,046, Cl. 340-595.000.
Heinz, Gerhard: *See*—
Lausberg, Dietrich; Blinne, Gerd; Ittemann, Peter; Heinz, Gerhard; Seiler, Erhard; and Knoll, Manfred, 4,798,855, Cl. 523-435.000.
Helix Technology Corporation: *See*—
Higham, Graham J., 4,798,054, Cl. 62-6.000.
Hellekson, Ronald A.; Acosta, Jorge L.; and Campbell, John S., to Spectra-Physics, Inc. Shallow bar code scanner. 4,799,164, Cl. 235-467.000.
Hemphill, J. Marshall; and Hoffer, Roy D., to Armstrong World Industries, Inc. Electronically dimmed power limited lighting system. 4,798,998, Cl. 315-297.000.
Hendricks, Roy J.: *See*—
Vicars, Paul D.; Hendricks, Roy J.; and Goubeaux, Eugene F., Jr., 4,798,556, Cl. 446-391.000.
Hendrickson, Roger R., to Morton Thiokol, Inc. Composite solid propellants containing bitetrazoles. 4,798,637, Cl. 149-20.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Ansmann, Achim, 4,798,682, Cl. 252-312.000.
Ritter, Wolfgang; Handwerk, Hans-Peter; Schlueter, Kaspar; and Hassenjuergen, Heinz, 4,797,964, Cl. 8-115.600.
Strzalko, Peter; Walber, Franz-Josef; and Wombacher, Ulrich, 4,799,133, Cl. 362-133.000.
Henoch, Bengt. Device for transmitting electric energy to computers and data nets. 4,798,990, Cl. 310-334.000.
Henry, Danise: *See*—
Henry, Verlyn; and Henry, Danise, 4,798,539, Cl. 434-319.000.
Henry, Verlyn; and Henry, Danise. Prenatal learning device and method. 4,798,539, Cl. 434-319.000.
Hensel, Hartmut: *See*—
Dallman, Hermann; Hensel, Hartmut; and Schafer, Werner, 4,798,759, Cl. 428-220.000.
Herbert, William G., to Cooper Industries, Inc. Bifurcated fuse clip. 4,798,546, Cl. 439-830.000.
Hercules Defense Electronics Systems Inc.: *See*—
Powers, Vernon B.; and Murphy, Deborah C., 4,797,992, Cl. 29-600.000.
Hercules Incorporated: *See*—
Jurkiewitsch, George, 4,798,570, Cl. 493-44.000.
Modrak, James P.; and Roberts, Owen P., 4,798,757, Cl. 428-198.000.
Herden, Werner: *See*—
Benedikt, Walter; Heess, Gerhard; Herden, Werner; Friese, Karl-Hermann; Reum, Helmut; Schmatz, Jurgen; and Schwab, Siegbert, 4,798,991, Cl. 313-137.000.
Herklotz, Gunther; and Eligehausen, Hans, to Leybold-Heraeus GmbH. Sputtering installation for the reactive coating of a substrate with hard materials. 4,798,663, Cl. 204-298.000.
Hermach, Carl J.; and Houy, Duane H., to Publishers Equipment Corporation. Conversion of letterpress to offset pr'nting. 4,798,137, Cl. 101-211.000.
Hermann, George D.: *See*—
Giesy, Jerry D.; Hermann, George D.; and Hoskins, Matthew W., 4,798,193, Cl. 128-7.000.
Hernandez, Kenneth J., to Manville Corporation. Basket-type carrier for elongated articles. 4,798,285, Cl. 206-180.000.
Herrin, J. Pearman. Process sequencing for amine regeneration. 4,798,910, Cl. 564-497.000.
Hersberger, Jill G.: *See*—
Spadafora, Peter J.; Hersberger, Jill G.; Bell, Myron H.; and Harding, Robert L., 4,799,178, Cl. 364-565.000.
Herzog, Reinhold; Padinger, Reinhard; Rainer, Hans-Peter; and Schober, Helmo, to D 3 Cathodic Products-Korrosionsschutzprodukte Gesellschaft m.b.H. Device for the cathodic corrosion-protection of metal parts. 4,798,658, Cl. 204-147.000.
Heslin, Peter M., to Honeywell Bull Inc. On chip signal selection method and apparatus. 4,799,147, Cl. 364-200.000.
Hess, Albert J., III, to Laser Applications, Inc. Simultaneously cutting and welding sheet metal using laser energy. 4,798,931, Cl. 219-121.640.
Hetherington, Michael W.; Garner, David P.; and Millman, Allan D., to Iona Appliances Inc.; and Appareils Iona Inc. Surface cleaning apparatus. 4,798,613, Cl. 55-52.000.
Hettrick, Michael C., to United States of America, Energy. Aplanatic and quasi-aplanatic diffraction gratings. 4,798,446, Cl. 350-162.230.
Hetzler, Connie L.: *See*—
Meyer, Stephen C.; Lance, Roger L.; Hetzler, Connie L.; Dunkerly, Cedric A., II; Roessler, Thomas H.; Zenker, David L.; and Sciaraffa, Michael A., 4,798,603, Cl. 604-378.000.
Hewlett-Packard Company: *See*—
Cook, Stephen J.; and Bullock, Michael L., 4,799,007, Cl. 324-158.00F.
Firooz, Kamran; Harwood, Vance R.; Illick, Robert C., Jr.; and Crook, David T., 4,799,023, Cl. 328-110.000.
Heyler, Charles J., III: *See*—
Hancock, John C.; Dubrul, William R.; and Heyler, Charles J., III, 4,798,584, Cl. 604-93.000.
Hickner, Richard A.: *See*—
Hoffman, Dwight K.; Harris, Robert F.; and Hickner, Richard A., 4,798,877, Cl. 525-531.000.
Hidaka, Hiroyoshi; and Morikawa, Anri, to Asahi Kasei Kogyo Kabushiki Kaisha. Isoquinoline derivatives. 4,798,897, Cl. 546-139.000.
Higby, Jeffrey P.; McElroy, Kennedy K.; and Zorc, Philip A., to Outboard Marine Corporation. Propeller shaft bearing housing retention system. 4,798,548, Cl. 440-78.000.
Higham, Graham J., to Helix Technology Corporation. Linear drive motor with flexure bearing support. 4,798,054, Cl. 62-6.000.
Hildebrand, David B.: *See*—
Johnson, Charles B.; Box, Jeffrey L.; and Hildebrand, David B., 4,799,216, Cl. 370-67.000.
Hill, Gordon S., to Grumman Aerospace Corporation. Method and apparatus for isolating faults in an antenna system. 4,799,063, Cl. 343-703.000.
Hill, Wayne S.: *See*—
Gerstmann, Joseph; Celorier, George M., Jr.; and Hill, Wayne S., 4,798,240, Cl. 165-48.100.
Hillstead, Richard A., to Cordis Corporation. Medical instrument valve. 4,798,594, Cl. 604-167.000.
Hilti Aktiengesellschaft: *See*—
Hoereth, Hans-Jurgen; and Neumaier, Anton, 4,798,249, Cl. 173-14.000.
HIMONT Incorporated: *See*—
Bertelli, Guido; Busi, Patrizia; and Locatelli, Renato, 4,798,857, Cl. 524-93.000.
Hing Wah Houseware Manufactory Ltd.: *See*—
Chan, Hing W., 4,798,132, Cl. 99-331.000.
Hirai, Bunji: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Hirai, Bunji; and Sugibuchi, Kazuo, 4,798,836, Cl. 524-89.000.
Hiraki, Tomoyoshi: *See*—
Nagano, Makoto; Nakanishi, Akira; Hiraki, Tomoyoshi; Ueno, Akira; Takahashi, Shoji; Kobayashi, Shuhei; Yamamoto, Akihiro; and Kodama, Fumio, 4,798,758, Cl. 428-213.000.
Hirano, Masami: *See*—
Nohara, Shigezo; Hirata, Sadao; Matsuo, Junichi; Hirano, Masami; and Tanikawa, Isao, 4,798,697, Cl. 264-255.000.
Hirata, Sadao: *See*—
Nohara, Shigezo; Hirata, Sadao; Matsuo, Junichi; Hirano, Masami; and Tanikawa, Isao, 4,798,697, Cl. 264-255.000.
Hirayama, Yasuhiko: *See*—
Inoue, Masahide; Ichitsuka, Takeshi; Hirayama, Yasuhiko; Koshikawa, Shozo; Kitsoka, Tateki; Nakabayashi, Nobuo; Takeda, Tatsumichi; and Minoo, Osamu, 4,798,585, Cl. 604-93.000.
Hirono, Tatsuo: *See*—
Kikuno, Mitsutoyo; Hirono, Tatsuo; Nakashima, Yoshihiro; and Yoshino, Hirobumi, 4,799,081, Cl. 355-14.00C.
Hirooka, Masaaki; Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Apparatus for continuously preparing a light receiving element for use in photoelectromotive force member or image-reading photosensor. 4,798,166, Cl. 118-719.000.
Hirooka, Masaaki; Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Process for preparing photoelectromotive force member. 4,798,809, Cl. 437-4.000.
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; and Hosono, Yoichi, to Mitsui Toatsu Chemicals, Incorporated; and Yamamoto Chemicals, Inc. Fabrication process of optical recording medium. 4,798,781, Cl. 430-270.000.
Hirotsu, Tetsuji; Nakamura, Kiyoshi; Kasai, Syoji; Yamaguchi, Hiroshi; and Kozu, Eiji, to Hitachi, Ltd. Control apparatus for maintaining traction in electric rolling stock. 4,799,161, Cl. 364-426.010.
Hirsch, Mark D. Surfboard and method of making same. 4,798,549, Cl. 441-74.000.
Hirsch, Thomas S.: *See*—
Goss, Gary J.; Hirsch, Thomas S.; and Holtey, Thomas O., 4,799,145, Cl. 364-200.000.
Hisada, Katsutoshi; Kokubu, Nobuaki; Sakurai, Shigeki; Murata, Yukio; and Okano, Tatsuo, to Canon Kabushiki Kaisha. Image signal coding apparatus. 4,799,110, Cl. 358-261.300.
Hitachi Automotive Engineering Co., Ltd.: *See*—
Ichikawa, Norio; Itsuji, Takayuki; and Miki, Masayuki, 4,799,018, Cl. 324-465.000.
Hitachi, Ltd.: *See*—
Hirotsu, Tetsuji; Nakamura, Kiyoshi; Kasai, Syoji; Yamaguchi, Hiroshi; and Kozu, Eiji, 4,799,161, Cl. 364-426.010.
Ichikawa, Norio; Itsuji, Takayuki; and Miki, Masayuki, 4,799,018, Cl. 324-465.000.
Ikeda, Takahide; Watanabe, Atsuo; Mukai, Touji; Odaka, Masanori; and Ogiue, Katsumi, 4,799,098, Cl. 357-43.000.
Kamejima, Kohji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Yamamoto, Hiroshi, 4,799,267, Cl. 382-1.000.

Koshi, Hiroyuki, 4,798,463, Cl. 356-318.000.
Moriyama, Shigeo; Kurosaki, Toshiei; Terasawa, Tsuneo; Okazaki, Shinji; and Kawamura, Yoshio, 4,798,470, Cl. 356-401.000.
Nakano, Hiraku; and Murayama, Hiroshi, 4,799,183, Cl. 364-760.000.
Okamoto, Yukio; Shinada, Shinichi; Suzuki, Kenkichi; and Kougami, Akihiko, 4,799,058, Cl. 340-811.000.
Saito, Cyuichi, 4,798,274, Cl. 198-324.000.
Watanabe, Hideo, 4,798,921, Cl. 200-144.00B.
Yamada, Masamichi; Kurebayashi, Masaaki; Saito, Masakatsu; Yanagihara, Hitoshi; Konishi, Katsuo; and Tsuchiya, Toshio, 4,799,118, Cl. 360-125.000.
Yasuda, Koichi, 4,798,552, Cl. 445-64.000.

Hitachi Maxell, Ltd.: *See*—
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Hitzman, Donald O., to Phillips Petroleum Company. Production of methane by anaerobic fermentation of waste materials. 4,798,801, Cl. 435-313.000.

Hiyamizu, Satoshi; and Fujii, Toshio, to Fujitsu Limited. High electron mobility single heterojunction semiconductor devices and methods for production thereof. 4,799,088, Cl. 357-16.000.

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Hochstein, Peter A. Electro-optical windshield moisture sensing. 4,798,956, Cl. 250-341.000.

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Hocker, Jurgen; Rottmaier, Ludwig; Reinking, Klaus; Kirsch, Jurgen; and Fullmann, Heinz-Josef, to Bayer Aktiengesellschaft. Organic polymers with electrical properties. 4,798,686, Cl. 252-500.000.

Hodgson, Philip K. G.; and Stewart, Nevin J., to British Petroleum Company p.l.c., The. Preparation of alkoxy halides. 4,798,906, Cl. 568-614.000.

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Ishikawa, Minoru: *See*—
Nagumo, Akihiko; Ishikawa, Minoru; and Kawada, Ken, 4,799,085, Cl. 355-27.000.
Ishikawa, Takatoshi; Fujimoto, Hiroshi; Ohki, Nobutaka; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Method of processing silver halide color photographic material and photographic color developing composition. 4,798,783, Cl. 430-372.000.
Ishizaka, Yasuo; Watanabe, Noboru; Kimura, Kazuo; and Imaoka, Eiichiro, to Victor Company of Japan Ltd. Perpendicular magnetic recording medium. 4,798,765, Cl. 428-336.000.
Ishizaka, Yuji, to Kabushiki Kaisha Meidensha. Method for measuring effective heating power for high frequency heating. 4,798,925, Cl. 219-10.410.
Isobe, Osamu: *See*—
Takase, Sadao; Takeda, Hitoshi; and Isobe, Osamu, 4,798,105, Cl. 74-866.000.
Issenmann, Olivier, to Geoservices, Societe Anonyme. Apparatus and process for pyrolysis and analysis of samples containing organic matter. 4,798,805, Cl. 436-157.000.
Isuzu Motors Limited: *See*—
Kawamura, Hideo; and Tamai, Katsuyuki, 4,798,257, Cl. 180-165.000.
Itagaki, Shuichi: *See*—
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,799,127, Cl. 361-321.000.
Ito, Haruyuki: *See*—
Sato, Kimiteru; and Ito, Haruyuki, 4,798,525, Cl. 425-84.000.
Ito, Kazuo: *See*—
Nagasawa, Hikoshi; Ito, Kazuo; Horii, Shigeru; and Tanoshima, Katsuhide, 4,799,271, Cl. 382-40.000.
Ito, Masami: *See*—
Otomo, Kikuo; Yamagushi, Masashi; Ito, Masami; and Tokunaga, Hiroki, 4,798,913, Cl. 570-211.000.
Ito, Meiji: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; Matsuda, Toshiaki; Ito, Meiji; Kamiguchi, Taiji; Teshima, Nobue; and Akama, Hiroshi, 4,798,813, Cl. 502-60.000.
Ito, Noritugu, to Brother Kogyo Kabushiki Kaisha. Switchable automatic or manual mode paper feeding device having a bidirectionally operated motor for a printer. 4,798,374, Cl. 271-9.000.
Ito, Shoji; and Minoura, Mikio, to Aisan Kogyo Kabushiki Kaisha. Method of controlling injector. 4,798,188, Cl. 123-478.000.
Ito, Yoshinori: *See*—
Ichigaya, Hiroshi; Tagawa, Susumu; Sugii, Yasuoshi; Ando, Masanori; Yamazaki, Jun; Kawada, Yasuo; Kinoshita, Tokuko; Shirahama, Toshio; Ito, Yoshinori; and Munemoto, Eiji, 4,798,992, Cl. 313-406.000.
Ito, Yuji, to Sony Corp. Video signal recording and/or reproducing apparatus with a function for re-recording a search control-index signal. 4,799,111, Cl. 360-14.300.
Itoh, Hideaki, to Fujitsu Limited. Channel-system exchange system for digital data radio-communication system. 4,799,237, Cl. 375-38.000.
Itoh, Teruaki. Apparatus for distributing liquid samples among test tubes and for dividing the test tubes into groups. 4,798,095, Cl. 73-863.010.
Itoh, Tetsuroh, to Mitsubishi Denki Kabushiki Kaisha. Wire electric discharge machining apparatus. 4,798,929, Cl. 219-69.00W.
Itoh, Yasuo: *See*—
Horiguchi, Fumio; Itoh, Yasuo; Ogura, Mitsugi; and Momodomi, Masaki, 4,799,193, Cl. 365-149.000.
Itoyama, Kuniyoshi; Horita, Norihiro; Seki, Shigemi; and Minami, Satoyuki, to Toray Industries, Inc. Biaxially oriented polyester film. 4,798,875, Cl. 525-444.000.
Itsuji, Takayuki: *See*—
Ichikawa, Norio; Itsuji, Takayuki; and Miki, Masayuki, 4,799,018, Cl. 324-465.000.
ITT Corporation: *See*—
Clark, Kenneth M.; Borsuk, Leslie M.; and Coutts, Bruce, 4,798,431, Cl. 350-96.200.
Clark, Kenneth M., 4,798,441, Cl. 350-96.200.
Ittemann, Peter: *See*—
Lausberg, Dietrich; Blinne, Gerd; Ittemann, Peter; Heinz, Gerhard; Seiler, Erhard; and Knoll, Manfred, 4,798,855, Cl. 523-435.000.
Ivan's Idiosyncrasy, Inc.: *See*—
Gibas, Daniel P., 4,798,265, Cl. 184-105.100.
Iwahashi, Hiroshi; and Asano, Masamichi, to Kabushiki Kaisha Toshiba. Semiconductor memory device with a sense amplifier. 4,799,195, Cl. 365-185.000.
Iwami, Tomoyuki: *See*—
Hattori, Etsuo; Iwami, Tomoyuki; Miyazaki, Yoshihiro; and Ohbuchi, Ryutaroh, 4,799,056, Cl. 340-799.000.
Iwamoto, Taro: *See*—
Kamejima, Kohji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Yamamoto, Hiroshi, 4,799,267, Cl. 382-1.000.
Iwao, Toshio, to Kabushiki Kaisha Toshiba. Microprogram control circuit. 4,799,151, Cl. 364-200.000.
Iwasaki, Yoshiya: *See*—
Fujita, Takayuki; Iwasaki, Yoshiya; and Yabe, Hiroko, 4,798,844, Cl. 514-399.000.
Iwatschenko, Peter, to Pfrummer-Viggo GmH+Co. KG. Stiffening of probes. 4,798,593, Cl. 604-164.000.
Iyanicki, Andrzej T. Pipe coupling. 4,798,404, Cl. 285-12.000.
Izumino, Satomi, to Tanashin Denki Co., Ltd. Flat cable connecting device. 4,799,129, Cl. 361-428.000.
J. D. Moller Optische Werke GmbH: *See*—
Duis, Wilhelm, 4,798,966, Cl. 250-578.000.
J & S Electronics, Inc.: *See*—
Gravely, Charles T., 4,798,971, Cl. 307-141.000.
Jacobson, John: *See*—
Vanmeggelen, Peter; and Jacobson, John, 4,798,072, Cl. 72-132.000.
Jaeger: *See*—
Lazareff, Andre , 4,798,161, Cl. 116-28.100.
Jaeggi, Franz-Josef, to Ciba-Geigy Corporation. 2-alkoxy-5-chlorobenzenesulfonates useful for the preparation of 2-alkoxybenzosulfonamides. 4,798,688, Cl. 260-512.00R.
Jagani, Anand M.: *See*—
Eastman, Richard E.; and Jagani, Anand M., 4,798,097, Cl. 74-15.880.
Jagst, Peter, to Trutzschler GmbH & Co. Kg. Waste separator for a card. 4,797,980, Cl. 19-107.000.
Jagst, Peter; and Thannheiser, Axel, to Trutzschler GmbH & Co. KG. Blower-conveyor for textile fiber tufts in a cleaning line and method. 4,798,516, Cl. 415-121.00A.
Jakubowicz, Raymond F.; and Lercher, John S., to Eastman Kodak Company. Compact analyzer. 4,798,705, Cl. 422-63.000.
Jalbert, Ronald L.: *See*—
Grant, Thomas S.; Jalbert, Ronald L.; and Whalen, David, 4,798,865, Cl. 525-92.000.
James, Roger: *See*—
Glen, John B.; and James, Roger, 4,798,846, Cl. 514-731.000.
James, Virtious, Jr. Ball caddy. 4,798,319, Cl. 224-251.000.
Jancaitis, Kenneth S.; and Powell, Howard T., to United States of America, Energy. Flashlamp radiation recycling for enhanced pumping efficiency and reduced thermal load. 4,799,233, Cl. 372-70.000.
Janes, Richard, to Spalding & Evenflo Companies, Inc. Double inverted bridge tennis racket. 4,798,382, Cl. 273-73.00C.
Janesick, James R.; and Elliott, Stythe T., to California Institute of Technology. CCD imaging sensors. 4,798,958, Cl. 250-370.010.
Jansen, Gerardus L. M.; and Smulders, Henricus J., to U.S. Philips Corporation. Lens mounting for an electrodynamic device for recording on and/or scanning optical discs by means of a radiation spot, and method of manufacturing such a lens mounting. 4,798,447, Cl. 350-255.000.
Janssen, Daniel J. G., to U.S. Philips Corp. Telecommunication system comprising a bus conductor and telecommunication stations con-

nected to this bus conductor through transformers. 4,799,236, Cl. 375-36.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Kasai, Kiyoshi; Hattori, Masayuki; Takeuchi, Hiromi; and Sakurai, Nobuo, 4,798,691, Cl. 264-47.000.
Jarnagin, Jerry D.; and Dawson, Dennis W., to Safe Aire, Inc. Method and apparatus for collecting and discharging radon gas and fluids. 4,798,034, Cl. 52-169.500.
Jarrett, Frank N.; and Munch, John E., Jr., to Modine Manufacturing. Mixed helix turbulator for heat exchangers. 4,798,241, Cl. 165-109.100.
Jautelat, Manfred: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Bachel, Karl H.; Brandes, Wilhelm; Hansaler, Gerd; and Reinecke, Paul, 4,798,899, Cl. 548-262.000.
Jeanmonod, Maurice: *See*—
Bonello, Philippe; and Jeanmonod, Maurice, 4,798,598, Cl. 604-280.000.
Jenkins, John W., to Bellwether, Inc. Exercise machine. 4,798,379, Cl. 272-73.000.
Jennings, Richard P.: *See*—
Douglas, Joseph; and Jennings, Richard P., 4,799,190, Cl. 364-900.000.
Jensen, Klavs F.: *See*—
deBoer, Wiebe B.; Jensen, Klavs F.; Johnson, Wayne L.; Read, Gary W.; and Robinson, McDonald, 4,798,165, Cl. 118-715.000.
Jentes, Charles: *See*—
Weiss, Robert L.; Jentes, Charles; and Crowell, Richard J., 4,798,297, Cl. 211-65.000.
Jessup, James L., to Kendall Company, The. Apparatus for forming a visually detectable element. 4,798,581, Cl. 493-338.000.
Jidosha Kabushiki Kaisha: *See*—
Goshima, Takahiro; Hattori, Yoshiyuki; Kinbara, Hiroji; Otsuki, Hiromi; Nomura, Yoshihisa; and Nakanishi, Nobuyasu, 4,799,048, Cl. 340-626.000.
Joehr, Hans: *See*—
Glaus, Heinrich; Lehmann, Peter; Joehr, Hans; and Freiburghaus, Rene , 4,798,231, Cl. 140-119.000.
Joelson, Carl R. Closed loop system for the manufacture and handling of concrete pipe. 4,798,698, Cl. 264-271.100.
Johansson, Bertil. Magazine locking means for firearms having a magazine in a pistol grip. 4,798,018, Cl. 42-7.000.
Johansson, Karl N.; Lindborg, Bjorn G.; and Noren, Jan-Olof, to Astra Lakemedel Aktiebolag. Guanine derivative. 4,798,833, Cl. 514-262.000.
John Waddington PLC: *See*—
Freeman, Michael, 4,798,648, Cl. 156-542.000.
John Zink Company: *See*—
Pressnall, Dale W.; Keller, Michael R.; and Schwartz, Robert E., 4,798,150, Cl. 110-171.000.
Johns Hopkins University, The: *See*—
Kim, Boris F.; and Bohandy, Joseph, 4,799,270, Cl. 382-27.000.
Johnson, Alfred H.; Pohl, Peter; Prauer, Heinz; and Schulz, Dietmar, to Siemens AG; and IBM. Lightwave guide connector with release levers. 4,798,430, Cl. 350-96.200.
Johnson, Arthur K., Sr. Waterbed heater. 4,798,936, Cl. 219-217.000.
Johnson, Charles B.; Box, Jeffrey L.; and Hildebrand, David B., to SRX Corporation. Distributed switching system. 4,799,216, Cl. 370-67.000.
Johnson, Ian M.; Moody, Ian M.; and Fleaher, Peter, to Allied Colloids Limited. Surface treatment of polymers. 4,798,861, Cl. 524-458.000.
Johnson Industries, Inc.: *See*—
Ball, Richard L., 4,798,359, Cl. 248-188.300.
Johnson, Jeffrey D.: *See*—
Dietz, Ronald P.; and Johnson, Jeffrey D., 4,799,140, Cl. 364-140.000.
Johnson Matthey, Inc.: *See*—
Becker, E. Robert; and Jung, Hyun J., 4,798,817, Cl. 502-217.000.
Johnson, Michael A.: *See*—
Wyeth, Richard W.; Johnson, Michael A.; and Globig, Michael A., 4,798,467, Cl. 356-349.000.
Johnson, Randy W.: *See*—
Lasslo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., 4,798,830, Cl. 514-314.000.
Johnson, Roosevelt: *See*—
Roy, Dhirendra C.; Johnson, Roosevelt; and Balazich, Gregory J., 4,798,545, Cl. 439-677.000.
Johnson, Terence P.: *See*—
Everitt, George F.; Johnson, Terence P.; and Pham, Lien-Huong A., 4,798,814, Cl. 501-89.000.
Johnson, Wayne L.: *See*—
deBoer, Wiebe B.; Jensen, Klavs F.; Johnson, Wayne L.; Read, Gary W.; and Robinson, McDonald, 4,798,165, Cl. 118-715.000.
Johnson, William N. H. Package and container for eggs. 4,798,133, Cl. 99-440.000.
Joiner, Karen A.: *See*—
King, Francis D.; and Joiner, Karen A., 4,798,829, Cl. 514-214.000.
Joncour, Christian, to ESSILOR INTERNATIONAL Cie Generale d'Optique. Ophthalmic lens centering device. 4,798,459, Cl. 356-127.000.
Jones, Richard G.: *See*—
O'Leary, William J.; Hartnett, Thomas J., Jr.; and Jones, Richard G., 4,798,590, Cl. 604-153.000.
Jones, Robert E.: *See*—
Chang, Stanley S.; Jones, Robert E.; and Bau, Hui, 4,797,995, Cl. 29-825.000.
Jones, Robert S. Rowing machine. 4,798,378, Cl. 272-72.000.
Jones, Stanley P.: *See*—
Foster, Thomas V.; Jones, Stanley P.; and Alderson, David L., 4,798,617, Cl. 65-25.100.
Jongenburger, Peter; and Singer, Robert, to BBC Brown Boveri AG. Superalloy with oxide dispersion hardening having improved corrosion resistance and based on nickel. 4,798,625, Cl. 75-235.000.
Jordy, George J.: *See*—
Curtin, James J.; Dorler, Jack A.; Jordy, George J.; and Leiner, Kenneth L., 4,798,976, Cl. 307-441.000.
Jorgensen, Allen R.; Belongia, Larry P.; Gordon, Kenneth A.; and La Haye, John L., to Magna-Graphics Corporation. Web rewind apparatus with cutless web transfer. 4,798,350, Cl. 242-64.000.
Joyce, George A.: *See*—
Ayala, Jorge A.; Joyce, George A.; and Crabbe, David, 4,798,856, Cl. 524-386.000.
Joyce, Peter; and Mackie, David M. Peroxide bleaching of mechanical pulps. 4,798,652, Cl. 162-60.000.
Jung, Hyun J.: *See*—
Becker, E. Robert; and Jung, Hyun J., 4,798,817, Cl. 502-217.000.
Junger, Martin: *See*—
Lierke, Ernst-Gunter; Grossbach, Rudolf; Heide, Wolfgang; Flogel, Karl; and Junger, Martin, 4,798,332, Cl. 239-102.200.
Jurkiewitsch, George, to Hercules Incorporated. Process for preparing filter rods. 4,798,570, Cl. 493-44.000.
K. Biological Science Laboratory Co., Ltd.: *See*—
Kaneda, Kichizo, 4,798,734, Cl. 426-565.000.
Kabadi, Ashok N.; Turner, Leonard O.; and White, Michael T., to Intel Corporation. High density flexible circuit. 4,798,918, Cl. 174-36.000.
kabelmetal electro Gesellschaft mit beschrankter Haftung: *See*—
Chahabadi, Ziaedin; Brahms, Martin; and Wittur, Olaf, 4,799,138, Cl. 363-21.000.
Kabushiki Kaisha Kenwood: *See*—
Sakamoto, Yoshio; and Yamazaki, Kaoru, 4,799,266, Cl. 381-193.000.
Takeda, Tamio; and Take, Minoru, 4,798,087, Cl. 73-649.000.
Kabushiki Kaisha Meidensha: *See*—
Ishizaka, Yuji, 4,798,925, Cl. 219-10.410.
Kabushiki Kaisha Mori Seiki Seisakusho: *See*—
Yamaguchi, Yoshinori; Nishiyama, Soichi; Maeda, Norihide; and Miyoshi, Masayasu, 4,797,991, Cl. 29-568.000.
Kabushiki Kaisha Mori Seiki Sisakusho: *See*—
Yamaguchi, Yoshinori; Nishiyama, Soichi; Maeda, Norihide; and Miyoshi, Masayasu, 4,797,990, Cl. 29-568.000.
Kabushiki Kaisha Toshiba: *See*—
Horiguchi, Fumio; Itoh, Yasuo; Ogura, Mitsugi; and Momodomi, Masaki, 4,799,193, Cl. 365-149.000.
Inaba, Katsuharu, 4,798,483, Cl. 400-120.000.
Inukai, Shinji; Kuno, Nobuyoshi; Takanishi, Hiroyoshi; and Sasaki, Hiroki, 4,799,135, Cl. 362-296.000.
Iwahashi, Hiroshi; and Asano, Masamichi, 4,799,195, Cl. 365-185.000.
Iwao, Toshio, 4,799,151, Cl. 364-200.000.
Minekane, Tomiharu, 4,798,703, Cl. 422-65.000.
Minomo, Shinzoo, 4,799,029, Cl. 331-107.00A.
Mori, Shojiro, 4,799,004, Cl. 324-73.00R.
Morita, Keiichi, 4,798,059, Cl. 62-228.400.
Nagasaka, Hiroko; Hatakoshi, Gen-ichi; Shimada, Naohiro; Yamamoto, Motoyuki; Okajima, Masaki; Iizuka, Yoshio; Kawata, Hatsumi; Kinoshita, Hideaki; and Matsuura, Nobuyuki, 4,799,228, Cl. 372-46.000.
Nakabayashi, Kazuto, 4,799,014, Cl. 324-314.000.
Nishioka, Syoji, 4,799,148, Cl. 364-200.000.
Ogura, Mitsugi; and Masuoka, Fujio, 4,798,794, Cl. 437-41.000.
Okamoto, Hiroshi; Fushimi, Kimio; and Suzuki, Susumu, 4,798,057, Cl. 62-228.300.
Sakui, Koji; and Watanabe, Shigeyoshi, 4,798,977, Cl. 307-446.000.
Shiota, Keiichi, 4,798,489, Cl. 400-216.100.
Sugiyama, Hisashi; Sugimoto, Yasuhiro; and Kamatani, Yukio, 4,798,980, Cl. 307-471.000.
Suzuki, Mitsuo, 4,799,180, Cl. 364-724.200.
Tone, Youichi, 4,798,513, Cl. 415-17.000.
Tsugaru, Kazunori; and Sugimoto, Yasuhiro, 4,798,981, Cl. 307-475.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Hattori, Katsuhiko; Suzuki, Hideyuki; and Ogasawara, Takeo, 4,798,561, Cl. 474-28.000.
Tachi, Kazuyuki; Okuda, Chikaaki; Yamada, Katsunori; Oyama, Yoichi; and Suzuki, Shoichi, 4,798,335, Cl. 239-296.000.
Kabushiki Kaisha Yokoyama Seisakusho: *See*—
Yokoyama, Michihiro, 4,797,986, Cl. 29-159.200.
Kabushiki Kaishi Toshiba: *See*—
Hanawa, Masatoshi, 4,799,012, Cl. 324-309.000.
Hatanaka, Masahiko, 4,799,013, Cl. 324-312.000.
Kaczmarczyk, Edward T.; Rae, Rory; and Noyes, Roger A., to Deere & Company. Method and apparatus for attaching a loader to a tractor. 4,798,511, Cl. 414-686.000.
Kaercher, Leo T.: *See*—
Colin, Joseph F.; Kaercher, Leo T.; and Roberts, Charles D., 4,798,368, Cl. 266-259.000.
Kaga, Hideki; and Kobayashi, Hisanori, to Nippondenso Co., Ltd. Joint structure for fluid supply pump and fluid supply pipe. 4,798,522, Cl. 417-363.000.
Kageyama, Shunji: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,798,838, Cl. 514-342.000.

Kahkipuro, Matti; Sten, Urpo; Nummi, Pekka; and Hytti, Pekka, to Kone Elevator GmbH. Voltage regulation for three-phase inverters. 4,799,139, Cl. 363-95.000.

Kai, Mariko: *See*—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,798,680, Cl. 252-299.010.

Kakehi, Norihiko: *See*—
Matsuishi, Naoto; Nakagawa, Yoshio; Amano, Michiaki; Kakehi, Norihiko; Kawashima, Toshio; and Omura, Shigeki, 4,798,832, Cl. 514-258.000.

Kaku, Takashi, to Fujitsu Limited. Two-wire full duplex frequency division multiplex modem system having echo cancellation means. 4,799,214, Cl. 370-32.100.

Kam, Sheung T.; Matier, William L.; Patil, Ghanshyam; and Mai, Khuong H. X., to Du Pont de Nemours, E. I., and Company. 2-hydroxypropylamine heteroaryl ester derivatives. 4,798,892, Cl. 544-146.000.

Kamatani, Yukio: *See*—
Sugiyama, Hisashi; Sugimoto, Yasuhiro; and Kamatani, Yukio, 4,798,980, Cl. 307-471.000.

Kamei, Masanao: *See*—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,798,680, Cl. 252-299.010.

Kamejima, Kohji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Yamamoto, Hiroshi, to Hitachi, Ltd. Image processing apparatus and processing method. 4,799,267, Cl. 382-1.000.

Kamiguchi, Taiji: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; Matsuda, Toshiaki; Ito, Meiji; Kamiguchi, Taiji; Teshima, Nobue; and Akama, Hiroshi, 4,798,813, Cl. 502-60.000.

Kaminaka, Ikuyasu, to Sharp Kabushiki Kaisha. Combined microwave and electric oven with intermittent power supply to both microwave and electric heating elements. 4,798,927, Cl. 219-10.55B.

Kaminsky, Richard: *See*—
Silverman, Lawrence H.; Teague, Randy; and Kaminsky, Richard, 4,799,034, Cl. 333-202.000.

Kamiya, Tamotsu: *See*—
Okabe, Yoshio; Kobayashi, Yukimori; Ishikawa, Makoto; Kamiya, Tamotsu; and Atsumi, Tomiaki, 4,798,563, Cl. 474-110.000.

Kamochi, Atsumi: *See*—
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; and Yagi, Shigeki, 4,798,620, Cl. 71-95.000.

Kanazawa, Yasunori; Arai, Haruo; and Kuwa, Tadahiro, to Hitachi Maxell, Ltd. Disc cartridge. 4,799,123, Cl. 360-133.000.

Kaneda, Kichizo, to K. Biological Science Laboratory Co., Ltd. Process for preparing soybean food products. 4,798,734, Cl. 426-565.000.

Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Semiconductor laser device having a buried heterostructure. 4,799,227, Cl. 372-46.000.

Kaneko, Hiromi: *See*—
Ushiro, Seimei; and Kaneko, Hiromi, 4,799,075, Cl. 354-289.100.

Kaneko, Kyoichi, to Daiwa Seiko Inc. Fishing reel. 4,798,355, Cl. 242-218.000.

Kaneko, Masanori, to Canon Kabushiki Kaisha. Ink ribbon cassette having mounting means, slack preventing means and multiple ribbon shifting means. 4,798,486, Cl. 400-208.000.

Kaneko, Tomiatsu; Yokoyama, Kazuaki; and Tsuruoka, Hisashi, to Miyoshi Oil & Fat Co., Ltd. Yeast-fermented food modifier. 4,798,733, Cl. 426-549.000.

Kanmuri, Noboru: *See*—
Kishi, Masahichi; Seki, Seizo; and Kanmuri, Noboru, 4,799,257, Cl. 380-9.000.

Kannari, Shigeru, to Advantest Corporation. AC level calibration apparatus. 4,799,008, Cl. 324-73.00R.

Kansai Chemical Engineering Co., Ltd.: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,798,131, Cl. 99-277.200.

Kanzaki Kokyukoki Mfg. Co.: *See*—
Azuma, Toshiro; and Hacegawa, Toshiyuki, 4,798,259, Cl. 180-233.000.

Kao Corporation: *See*—
Shirose, Toshihiro; and Sakurai, Akira, 4,798,601, Cl. 604-368.000.
Yahagi, Kazuyuki; and Suzuki, Toshio, 4,798,721, Cl. 424-70.000.

Kaplan, Jonathan I.; and Pero, Stephen M., to Polaroid Corporation. Common drive for shutter blades and objective lens assembly. 4,799,077, Cl. 354-400.000.

KAPPA messtechnik GmbH: *See*—
Gerner, Rudolf, 4,799,108, Cl. 358-213.260.

Kapuscinski, Maria M.: *See*—
Liu, Christopher S.; Grina, Larry D.; and Kapuscinski, Maria M., 4,798,678, Cl. 252-50.000.

Karim, Mohammad; and Patel, Madhu C., to NCR Corporation. Fiber optic coupling system. 4,798,428, Cl. 350-96.180.

Karino, Yukio: *See*—
Idota, Yoshio; Karino, Yukio; Hayashi, Hiroshi; and Tomiyama, Hideki, 4,798,779, Cl. 430-202.000.

Karius, Klaus D.: *See*—
Prochnow, Jurgen; Peters, Jorg; Theis, Ulrich; and Karius, Klaus D., 4,797,985, Cl. 29-1.210.

Karl Lautenschlager KG Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl, Jr., 4,797,972, Cl. 16-382.000.

Kasai, Kikuo; Kodera, Kimio; and Maki, Mitsuo, to Platinum Pen Co., Ltd. Article storage container. 4,798,310, Cl. 221-87.000.

Kasai, Kiyoshi; Hattori, Masayuki; Takeuchi, Hiromi; and Sakurai, Nobuo, to Japan Synthetic Rubber Co., Ltd. Capsule-shaped polymer particles and process for the production thereof. 4,798,691, Cl. 264-47.000.

Kasai, Syoji: *See*—
Hirotsu, Tetsuji; Nakamura, Kiyoshi; Kasai, Syoji; Yamaguchi, Hiroshi; and Kozu, Eiji, 4,799,161, Cl. 364-426.010.

Kasamura, Toshirou: *See*—
Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, 4,799,084, Cl. 355-14.0SH.

Kashiwa, Norio: *See*—
Yoshitake, Junichi; Kitani, Hiroaki; Kashiwa, Norio; Muranaka, Takeshi; Tominari, Kenichi; and Nagamatsu, Shigeki, 4,798,866, Cl. 525-191.000.

Kashiwayanagi, Yuzo: *See*—
Kojima, Seiji; Ikeda, Masakiyo; Kikuchi, Hiroshi; and Kashiwayanagi, Yuzo, 4,798,743, Cl. 427-255.000.

Katagiri, Kazuharu: *See*—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,798,680, Cl. 252-299.010.

Kato, Hajime: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,798,131, Cl. 99-277.200.

Kato, Hiroshi: *See*—
Ebinuma, Takanori; Kato, Hiroshi; and Sakurai, Mituko, 4,798,182, Cl. 123-195.00R.

Kato, Koichi; Yamada, Takao; and Kawahara, Kenji, to Takeda Chemical Industries, Ltd. Mutual separation of proteins. 4,798,886, Cl. 530-416.000.

Kato, Yasuyoshi; Konishi, Kunihiko; Matsuda, Toshiaki; Ito, Meiji; Kamiguchi, Taiji; Teshima, Nobue; and Akama, Hiroshi, to Babcock-Hitachi Kabushiki Kaisha. Catalyst for removing nitrogen oxide and process for producing the catalyst. 4,798,813, Cl. 502-60.000.

Katsumoto, Takehiko; and Kikuchi, Kunio, to Mitsubishi Jidousha Kogyo Kabushiki Kaisha. Pump. 4,798,517, Cl. 415-131.000.

Katz, Frances R.: *See*—
Friedman, Robert B.; Gottneid, David J.; Faron, Eugene J.; Pustek, Frank J.; and Katz, Frances R., 4,798,735, Cl. 426-578.000.

Katz, Sigmund, to American Thermocraft Corp. High strength feldspathic dental porcelains containing crystalline leucite. 4,798,536, Cl. 433-212.100.

Kauffman, William. Valve assembly particularly usable with a coffee brewing basket. 4,798,222, Cl. 137-132.000.

Kawada, Haruki: *See*—
Tomida, Yoshinori; Sakai, Kunihiro; Matsuda, Hiroshi; Kawada, Haruki; Eguchi, Ken; Kimura, Toshiaki; Takimoto, Kiyoshi; Saitoh, Kenji; and Miyazaki, Toshihiko, 4,798,740, Cl. 427-43.100.

Kawada, Ken: *See*—
Nagumo, Akihiko; Ishikawa, Minoru; and Kawada, Ken, 4,799,085, Cl. 355-27.000.

Kawada, Yasuo: *See*—
Ichigaya, Hiroshi; Tagawa, Susumu; Sugii, Yasuoshi; Ando, Masanori; Yamazaki, Jun; Kawada, Yasuo; Kinoshita, Tokuho; Shirahama, Toshio; Ito, Yoshinori; and Munemoto, Eiji, 4,798,992, Cl. 313-406.000.

Kawahara, Kenji: *See*—
Kato, Koichi; Yamada, Takao; and Kawahara, Kenji, 4,798,886, Cl. 530-416.000.

Kawahara, Takeshi: *See*—
Shinkawa, Kiyoshi; Kawahara, Takeshi; Hayakawa, Hideki; and Mori, Masaru, 4,799,162, Cl. 364-436.000.

Kawamura, Hideo; and Tamai, Katsuyuki, to Isuzu Motors Limited. Energy recovery apparatus for turbo compound engine. 4,798,257, Cl. 180-165.000.

Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Camera. 4,799,074, Cl. 354-173.100.

Kawamura, Yoshio: *See*—
Moriyama, Shigeo; Kurosaki, Toshiei; Terasawa, Tsuneo; Okazaki, Shinji; and Kawamura, Yoshio, 4,798,470, Cl. 356-401.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; Yamaguchi, Yoichi; and Takahashi, Akira, 4,798,082, Cl. 73-117.300.
Kosuge, Hideyoshi, 4,798,400, Cl. 280-796.000.

Kawasaki Steel Corporation: *See*—
Furukawa, Kusuo, 4,798,772, Cl. 428-600.000.
Iida, Sachihiro, 4,798,367, Cl. 266-80.000.

Kawasaki Steel Techno-Research Corporation: *See*—
Saito, Keiji; Takizawa, Yoshiro; and Takagi, Isao, 4,798,704, Cl. 422-99.000.

Kawashima, Toshio: *See*—
Matsuishi, Naoto; Nakagawa, Yoshio; Amano, Michiaki; Kakehi, Norihiko; Kawashima, Toshio; and Omura, Shigeki, 4,798,832, Cl. 514-258.000.

Kawata, Hatsumi: *See*—
Nagasaka, Hiroko; Hatakoshi, Gen-ichi; Shimada, Naohiro; Yamamoto, Motoyuki; Okajima, Masaki; Iizuka, Yoshio; Kawata, Hatsumi; Kinoshita, Hideaki; and Matsuura, Nobuyuki, 4,799,228, Cl. 372-46.000.

Kawatani, Masafumi: *See*—
Sano, Tetsuo; Hohki, Tetsuo; Kodama, Eiji; Yoshida, Takumi; Kawatani, Masafumi; and Tsujinaka, Hisayuki, 4,799,175, Cl. 364-552.000.
Kazda, Stanislav: *See*—
Wehinger, Egbert; Meyer, Horst; Knorr, Andreas; and Kazda, Stanislav, 4,798,840, Cl. 514-356.000.
Keeley, James W.: *See*—
Barlow, George J.; Keeley, James W.; and Nibby, Chester M., Jr., 4,799,222, Cl. 371-51.000.
Keller, Heinz; Lehner, Martin; Born, Reinhard; and Lotz, Hans-Georg, to Ferd. Ruesch AG. Device for the treatment of substances by UV radiation. 4,798,960, Cl. 250-504.00R.
Keller, Josef; and Steuer, Werner, to Fichtel & Sachs AG. Connection device for gearshift cable. 4,798,098, Cl. 74-470.000.
Keller, Michael R.: *See*—
Pressnall, Dale W.; Keller, Michael R.; and Schwartz, Robert E., 4,798,150, Cl. 110-171.000.
Keller, Roland: *See*—
Schneider, Wilhelm; and Keller, Roland, 4,798,270, Cl. 188-264.00G.
Kempf, Helmut; and Kopp, Hans, to Georg Fischer Aktiengesellschaft. Vehicle wheel. 4,798,418, Cl. 301-31.000.
Kendall Company, The: *See*—
Jessup, James L., 4,798,581, Cl. 493-338.000.
Kenner Parker Toys Inc.: *See*—
Cummings, Charles A., 4,799,171, Cl. 364-513.500.
Kenoun, Robert, to Motorola, Inc. Apparatus for sensor compensation. 4,798,093, Cl. 73-708.000.
Kensetsukiso Engineering Co., Ltd.: *See*—
Yamada, Kunimitsu, 4,798,499, Cl. 405-286.000.
Kent-Moore Corporation: *See*—
Murray, Gary P.; Lower, Ralph; Dunham, Byron J.; and Bulla, Don A., 4,798,055, Cl. 62-127.000.
Kenworthy, David M. A.; Bridgstock, Eric; and Dunkey, Edwin A. W., to Fusion Plastics Limited. Method of making electroweldable sockets. 4,797,993, Cl. 29-613.000.
Kersting, R. James, to Rampart Packaging Inc. Retortable containers with exterior modified polystyrene cap layer. 4,798,750, Cl. 428-36.700.
Khanna, Pyare; and Pearlman, Fred, to Syntex (U.S.A.) Inc. Serum pretreatment in digoxin immunoassay. 4,798,804, Cl. 436-94.000.
Khanna, Satish C., to Ciba-Geigy Corporation. Solid, stable dosage forms with an elastic film coating. 4,798,724, Cl. 424-480.000.
Khowaylo, Alex: *See*—
Averill, Robert G.; and Khowaylo, Alex, 4,798,610, Cl. 623-22.000.
Kia, Hamid G., to General Motors Corporation. Method of molding a laminated foamable sheet. 4,798,763, Cl. 428-285.000.
Kidde, Inc.: *See*—
Pearlman, Sheldon; Fridland, Anatoly; and Martin, Gunther J., 4,799,239, Cl. 375-88.000.
Kihara, Kunio: *See*—
Yasukawa, Eiki; Kihara, Kunio; and Tsuboi, Mayumi, 4,798,773, Cl. 429-192.000.
Kikuchi, Hiroshi: *See*—
Kojima, Seiji; Ikeda, Masakiyo; Kikuchi, Hiroshi; and Kashiwayanagi, Yuzo, 4,798,743, Cl. 427-255.000.
Kikuchi, Kunio: *See*—
Katsumoto, Takehiko; and Kikuchi, Kunio, 4,798,517, Cl. 415-131.000.
Kikuchi, Toshihiro: *See*—
Takiguchi, Takao; Matsumoto, Masakazu; and Kikuchi, Toshihiro, 4,798,777, Cl. 430-59.000.
Kikuno, Mitsutoyo; Hirono, Tatsuo; Nakashima, Yoshihiro; and Yoshino, Hirobumi, to Ricoh Company, Ltd. Copying system having copying and service program modes. 4,799,081, Cl. 355-14.00C.
Killestijn, Cornelis, to Skillpack B.V. Closing device for a holder and diaphragm for such a device. 4,798,302, Cl. 215-271.000.
Killian, Edmund F.; and Berliner, Wallace H., to Waldes Truarc Inc. Method and apparatus for making a bowed external spring retaining ring of the E-shaped type. 4,798,075, Cl. 72-327.000.
Kim, Boris F.; and Bohandy, Joseph, to Johns Hopkins University, The. Image classifier. 4,799,270, Cl. 382-27.000.
Kimberly-Clark Corporation: *See*—
Meyer, Stephen C.; Lance, Roger L.; Hetzler, Connie L.; Dunkerly, Cedric A., II; Roessler, Thomas H.; Zenker, David L.; and Sciaraffa, Michael A., 4,798,603, Cl. 604-378.000.
Kimura, Akiyoshi: *See*—
Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, 4,799,084, Cl. 355-14.0SH.
Kimura, Kazuo: *See*—
Ishizaka, Yasuo; Watanabe, Noboru; Kimura, Kazuo; and Imaoka, Eiichiro, 4,798,765, Cl. 428-336.000.
Kimura, Kenji: *See*—
Hosoya, Takamasa; and Kimura, Kenji, 4,799,104, Cl. 358-98.000.
Kimura, Takayoshi; Ojima, Yasuo; and Mori, Yoshiaki, to Sumitomo Metal Mining Company Limited. Flash smelting furnace. 4,798,532, Cl. 432-210.000.
Kimura, Toshiaki: *See*—
Tomida, Yoshinori; Sakai, Kunihiro; Matsuda, Hiroshi; Kawada, Haruki; Eguchi, Ken; Kimura, Toshiaki; Takimoto, Kiyoshi; Saitoh, Kenji; and Miyazaki, Toshihiko, 4,798,740, Cl. 427-43.100.
Kinbara, Hiroji: *See*—
Goshima, Takahiro; Hattori, Yoshiyuki; Kinbara, Hiroji; Otsuki, Hiromi; Nomura, Yoshihisa; and Nakanishi, Nobuyasu, 4,799,048, Cl. 340-626.000.
Kindle, Betty J.: *See*—
Claar, James A.; Thomas, Stephen J.; and Kindle, Betty J., 4,798,746, Cl. 427-407.100.
King, Francis D.; and Joiner, Karen A., to Beecham Group plc. 1-Azabicyclo[3,2,2]nonane derivatives having 5-HT receptor antagonist activity. 4,798,829, Cl. 514-214.000.
King, Harvey M., to Brown, Robert A., Jr. Method and apparatus for handling fuel. 4,798,191, Cl. 123-557.000.
Kinoshita, Hideaki: *See*—
Nagasaka, Hiroko; Hatakoshi, Gen-ichi; Shimada, Naohiro; Yamamoto, Motoyuki; Okajima, Masaki; Iizuka, Yoshio; Kawata, Hatsumi; Kinoshita, Hideaki; and Matsuura, Nobuyuki, 4,799,228, Cl. 372-46.000.
Kinoshita, Tokuho: *See*—
Ichigaya, Hiroshi; Tagawa, Susumu; Sugii, Yasuoshi; Ando, Masanori; Yamazaki, Jun; Kawada, Yasuo; Kinoshita, Tokuho; Shirahama, Toshio; Ito, Yoshinori; and Munemoto, Eiji, 4,798,992, Cl. 313-406.000.
Kirchhuebel, Rainer: *See*—
Gehrung, Hartmut; Knastel, Hermann; and Kirchhuebel, Rainer, 4,798,458, Cl. 351-242.000.
Kirry, Kenneth R.; and Visconti, Joseph V. Mail delivery signaling device. 4,798,326, Cl. 232-34.000.
Kirsch, Jurgen: *See*—
Hocker, Jurgen; Rottmaier, Ludwig; Reinking, Klaus; Kirsch, Jurgen; and Fullmann, Heinz-Josef, 4,798,686, Cl. 252-300.000.
Kishi, Masahichi; Seki, Seizo; and Kanmuri, Noboru, to Nippon Telegraph & Telephone Public Corporation. Wireless transmission system for PM modulation signal. 4,799,257, Cl. 380-9.000.
Kishimoto, Shinzo; Nishikawa, Toshihiro; Abe, Akira; and Nakajima, Junya, to Fuji Photo Film Co., Ltd. Method for processing a silver halide color photographic material including a hydrolyzable type dir coupler including bleaching and bleach-fixing processing. 4,798,784, Cl. 430-382.000.
Kitada, Fumihiko: *See*—
Okumoto, Kenzo; and Kitada, Fumihiko, 4,798,970, Cl. 307-119.000.
Kitamura, Hiroshi; and Yamagata, Seiichi, to Toray Industries, Inc. Artificial fur. 4,798,748, Cl. 428-15.000.
Kitamura, Mamoru: *See*—
Fujii, Noriaki; Kitamura, Mamoru; and Yamada, Akira, 4,798,946, Cl. 235-492.000.
Kitamura, Takashi: *See*—
Iimuro, Shigeru; Kitamura, Takashi; and Morimoto, Yoshio, 4,798,654, Cl. 203-94.000.
Kitani, Hiroaki: *See*—
Yoshitake, Junichi; Kitani, Hiroaki; Kashiwa, Norio; Muranaka, Takeshi; Tominari, Kenichi; and Nagamatsu, Shigeki, 4,798,866, Cl. 525-191.000.
Kitao, Yuichi: *See*—
Nakata, Masaru; and Kitao, Yuichi, 4,798,260, Cl. 180-253.000.
Kitaoka, Seiya; and Hanya, Masao, to Seikosha Co., Ltd. Alarm stop device for a timepiece. 4,799,204, Cl. 368-263.000.
Kitaoka, Tateki: *See*—
Inoue, Masahide; Ichitsuka, Takeshi; Hirayama, Yasuhiko; Koshikawa, Shozo; Kitaoka, Tateki; Nakabayashi, Nobuo; Takeda, Tatsumichi; and Minoo, Osamu, 4,798,585, Cl. 604-93.000.
Kito, Masahiro; Mori, Katsuhiro; and Mitsumoto, Takashi, to Aisin Seiki Kabushiki Kaisha Co., Ltd. Heat exchanger for recovering heat from exhaust gases. 4,798,242, Cl. 165-103.000.
Kiuchi, Takashi: *See*—
Someya, Shinzo; Akahira, Rokuro; Horino, Hiroshi; Ohnaka, Michihiro; and Kiuchi, Takashi, 4,798,618, Cl. 71-92.000.
Klaassen, Francois M., to U.S. Philips Corporation. Integrated circuit comprising complementary field effect transistors. 4,799,092, Cl. 357-23.120.
Kleber, Wolfgang: *See*—
Bauch, Helmut; Kleber, Wolfgang; and Auerbach, Dieter, 4,798,338, Cl. 239-692.000.
Klein, Peter: *See*—
Banziger, Fritz A.; and Klein, Peter, 4,799,263, Cl. 381-94.000.
Klemm, Ernest J.: *See*—
Edman, Walter W.; and Klemm, Ernest J., 4,798,722, Cl. 424-72.000.
Klingenbeck, Klaus; and Schittenhelm, Rudolf, to Siemens Aktiengesellschaft. Method and apparatus for non-contacting identification of the temperature distribution in an examination subject. 4,798,209, Cl. 128-653.000.
Klinner, Wilfred E., to National Research Development Corporation. Apparatus and method for briquetting fibrous crop or like materials. 4,798,529, Cl. 425-289.000.
Kloeckner CRA Technologie GmbH: *See*—
Brotzmann, Karl; Fassbinder, Hans-Georg; and Turner, Richard E., deceased, 4,798,624, Cl. 75-38.000.
Klug, Randy J.: *See*—
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Knabenhans, Fritz: *See*—
Staheli, Paul; and Knabenhans, Fritz, 4,797,979, Cl. 19-105.000.
Knavish, Leonard A.; and Haskins, David R., to PPG Industries, Inc. Multi-stage process and apparatus for refining glass or the like. 4,798,616, Cl. 65-135.000.

Knight, Thomas F.: *See*—
Nestler, Eric; and Knight, Thomas F., 4,799,055, Cl. 340-710.000.
Knight, Val R. Charcoal water filter/strainer. 4,798,672, Cl. 210-282.000.
Knipe, Charles D.; and Mather, Edward L., to BICC Public Limited Company. Optical cable. 4,798,443, Cl. 350-96.230.
Knodt, Ruediger W., to Xerox Corporation. Machine-operator interface methods. 4,799,083, Cl. 355-14.00R.
Knoll, Erwin: *See*—
Beer, Michael; Hofbauer, August; and Knoll, Erwin, 4,798,181, Cl. 123-188.0GC.
Knoll, Helmut: *See*—
Husslein, Julius; Wittauer, Gunther; Knoll, Helmut; and Dandl, Robert, 4,798,938, Cl. 219-395.000.
Knoll, Manfred: *See*—
Lausberg, Dietrich; Blinne, Gerd; Ittemann, Peter; Heinz, Gerhard; Seiler, Erhard; and Knoll, Manfred, 4,798,855, Cl. 523-435.000.
Knollenberg, Robert G., to Particle Measuring Systems, Inc. Particle size detection device having high sensitivity in high molecular scattering environment. 4,798,465, Cl. 356-336.000.
Knorr, Andreas: *See*—
Wehinger, Egbert; Meyer, Horst; Knorr, Andreas; and Kazda, Stanislav, 4,798,840, Cl. 514-356.000.
Knothe, Erich; Melcher, Franz-Josef; Maaz, Gunther; Dardat, K'aus; and Sodler, Walter, to Sartorius GmbH. Balance with wind guard. 4,798,250, Cl. 177-181.000.
Knothe, Erich; Maaz, Gunther; and Handwerk, Volker, to Sartorius GmbH. Drying balance with temperature control. 4,798,252, Cl. 177-245.000.
Knowles, Richard A.: *See*—
Enoch, Jay M.; and Knowles, Richard A., 4,798,456, Cl. 351-222.000.
Kobayashi, Hisanori: *See*—
Kaga, Hideki; and Kobayashi, Hisanori, 4,798,522, Cl. 417-363.000.
Kobayashi, Masashi, to Maruman Golf Co., Ltd. Club-head. 4,798,384, Cl. 273-172.000.
Kobayashi, Reiichi, to NEC Home Electronics Ltd. Digital color demodulator. 4,799,102, Cl. 358-23.000.
Kobayashi, Ryuichi: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,799,074, Cl. 354-173.100.
Kobayashi, Shuhei: *See*—
Nagano, Makoto; Nakanishi, Akira; Hiraki, Tomoyoshi; Ueno, Akira; Takahashi, Shoji; Kobayashi, Shuhei; Yamamoto, Akihiro; and Kodama, Fumio, 4,798,758, Cl. 428-213.000.
Kobayashi, Yukimori: *See*—
Okabe, Yoshio; Kobayashi, Yukimori; Ishikawa, Makoto; Kamiya, Tamotsu; and Atsumi, Tomiaki, 4,798,563, Cl. 474-110.000.
Koblish, Theodore R.: *See*—
Mancini, Alfred A.; Sager, James W.; and Koblish, Theodore R., 4,798,330, Cl. 239-8.000.
Koch, Russell W.; and Snyder, Douglas D., to Firestone Tire & Rubber Company, The. Tire repair by "patch only" method. 4,798,640, Cl. 156-95.000.
Kochilla, Richard J.; and Esterle, Otto J., to Corrpro Companies, Inc. Cathodic protection system. 4,798,657, Cl. 204-147.000.
Kocks Technik GmbH & Co.: *See*—
Staat, Karlhans; and Moltner, Hermann, 4,798,071, Cl. 72-97.000.
Kodama, Eiji: *See*—
Sano, Tetsuo; Hohki, Tetsuo; Kodama, Eiji; Yoshida, Takumi; Kawatani, Masafumi; and Tsujinaka, Hisayuki, 4,799,175, Cl. 364-552.000.
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Nagano, Makoto; Nakanishi, Akira; Hiraki, Tomoyoshi; Ueno, Akira; Takahashi, Shoji; Kobayashi, Shuhei; Yamamoto, Akihiro; and Kodama, Fumio, 4,798,758, Cl. 428-213.000.
Kodama, Hisashi: *See*—
Okabe, Yoshio; Arai, Fumio; and Kodama, Hisashi, 4,798,180, Cl. 123-90.580.
Kodama, Yukinori; Mochizuki, Hirohiko; Nakano, Masao; Ohira, Tsuyoshi; and Nomura, Hidenori, to Fujitsu Limited; and Fujitsu VLSI Limited. Semiconductor memory device having a CMOS sense amplifier. 4,799,197, Cl. 365-205.000.
Kodera, Kimio: *See*—
Kasai, Kikuo; Kodera, Kimio; and Maki, Mitsuo, 4,798,310, Cl. 221-87.000.
Koenhen, Dirk M.: *See*—
Roesink, Hendrik D. W.; Smolders, Cornelis A.; Mulder, Marcellinus H. V.; and Koenhen, Dirk M., 4,798,847, Cl. 521-50.000.
Koeppe, Siegmar, to Siemens Aktiengesellschaft. Monolithic integrated circuit comprising circuit branches parallel to one another. 4,799,096, Cl. 357-42.000.
Koffel, William K.: *See*—
Hsia, Edward S.; Starkweather, John H.; and Koffel, William K., 4,798,515, Cl. 415-115.000.
Koga, Noriyuki: *See*—
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Koga, Yasunori: *See*—
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Kogure, Yoshikazu: *See*—
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Kohara, Masanobu; and Shibata, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device having a mos transistor and superposed capacitor. 4,799,093, Cl. 357-23.600.
Kohno, Katsumi: *See*—
Aoki, Tokuei; Kudo, Junichiro; and Kohno, Katsumi, 4,798,767, Cl. 428-412.000.
Kohus, Louis M.; and Mariol, John V., to KohusMariol, Inc. Two piece booster seat with multiple seat heights. 4,798,412, Cl. 297-250.000.
KohusMariol, Inc.: *See*—
Kohus, Louis M.; and Mariol, John V., 4,798,412, Cl. 297-250.000.
Koike, Atsushi: *See*—
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Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, to Canon Kabushiki Kaisha. Image forming apparatus. 4,799,084, Cl. 355-14.0SH.
Kojima, Seiji; Ikeda, Masakiyo; Kikuchi, Hiroshi; and Kashiwayanagi, Yuzo, to Furukawa Electric Co., Ltd., The. Vapor deposition method for the GaAs thin film. 4,798,743, Cl. 427-255.000.
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, to Yamanouchi Pharmaceutical Co., Ltd. Certain pyridinyl or imidazolinyl-4-thiazolyl-phenoxy alkanoic acid derivatives having lipid lowering activity. 4,798,838, Cl. 514-342.000.
Kokta, Bohuslav, to Stake Technology Ltd. Process for preparing pulp for paper making. 4,798,651, Cl. 162-22.000.
Kokubu, Nobuaki: *See*—
Hisada, Katsutoshi; Kokubu, Nobuaki; Sakurai, Shigeki; Murata, Yukio; and Okano, Tatsuo, 4,799,110, Cl. 358-261.300.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Inoue, Yoshiyuki; Takahashi, Masaaki; Tatekura, Koichi; Nishikawa, Hitoshi; Ohta, Hajime; and Kogure, Yoshikazu, 4,798,969, Cl. 307-112.000.
Kokusai Gijutsu Kaihatsu Kabushiki Kaisha: *See*—
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Komatsu Zenoah Co.: *See*—
Ebinuma, Takanori; Kato, Hiroshi; and Sakurai, Mituko, 4,798,182, Cl. 123-195.00R.
Komiya, Katsuyuki, to Mazda Motor Corporation. Vehicle suspension mechanism. 4,798,397, Cl. 280-690.000.
Kone Elevator GmbH: *See*—
Kahkipuro, Matti; Sten, Urpo; Nummi, Pekka; and Hytti, Pekka, 4,799,139, Cl. 363-95.000.
Konishi, Katsuo: *See*—
Yamada, Masamichi; Kurebayashi, Masaaki; Saito, Masakatsu; Yanagihara, Hitoshi; Konishi, Katsuo; and Tsuchiya, Toshio, 4,799,118, Cl. 360-125.000.
Konishi, Kunihiko: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; Matsuda, Toshiaki; Ito, Meiji; Kamiguchi, Taiji; Teshima, Nobue; and Akama, Hiroshi, 4,798,813, Cl. 502-60.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Yagi, Toshihiko; and Shimura, Shinya, 4,798,775, Cl. 430-569.000.
Kopp, Hans: *See*—
Kempf, Helmut; and Kopp, Hans, 4,798,418, Cl. 301-31.000.
Koshi, Hiroyuki, to Hitachi, Ltd. Spectrofluorophotometer. 4,798,463, Cl. 356-318.000.
Koshikawa, Shozo: *See*—
Inoue, Masahide; Ichitsuka, Takeshi; Hirayama, Yasuhiko; Koshikawa, Shozo; Kitaoka, Tateki; Nakabayashi, Nobuo; Takeda, Tatsumichi; and Minoo, Osamu, 4,798,585, Cl. 604-93.000.
Kosuge, Hideyoshi, to Kawasaki Jukogyo Kabushiki Kaisha. Lightweight and strong vehicle frame for a four wheeled buggy operated by a seated driver. 4,798,400, Cl. 280-796.000.
Kougami, Akihiko: *See*—
Okamoto, Yukio; Shinada, Shinichi; Suzuki, Kenkichi; and Kougami, Akihiko, 4,799,058, Cl. 340-811.000.
Kovner, Vladimir: *See*—
Bremmer, Robert A.; Kovner, Vladimir; and Stone, Dennis C., 4,799,112, Cl. 360-31.000.
Koyama, Mototsugu: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; and Nagaoka, Masaaki, 4,798,770, Cl. 428-547.000.
Kozek, Edward P.: *See*—
Balcom, James E.; Kozek, Edward P.; and Alderman, Arnold N., 4,799,039, Cl. 340-333.000.
Kozel, George E.: *See*—
Long, Carl K.; and Kozel, George E., 4,798,060, Cl. 62-310.000.
Kozu, Eiji: *See*—
Hirotsu, Tetsuji; Nakamura, Kiyoshi; Kasai, Syoji; Yamaguchi, Hiroshi; and Kozu, Eiji, 4,799,161, Cl. 364-426.010.
Kozyrski, Vincent T.; and Peters, Alan R., to Fletcher-Terry Company, The. Head assembly for mat cutting machine. 4,798,112, Cl. 83-455.000.
Kraabel, Mark T.: *See*—
Haeg, Steven R.; and Kraabel, Mark T., 4,798,088, Cl. 73-669.000.
Kraemer & Grebe GmbH & Co. KG Maschinenfabrik: *See*—
Schmeck, Alfred, 4,798,115, Cl. 83-639.000.
Kraft, Inc.: *See*—
Mehnert, David W.; and Dinwoodie, Robert C., 4,798,798, Cl. 435-239.000.

Kramer, L. Jonathan; and Petersen, Steven R., to Drexelbrook Controls, Inc. Multiple set point condition monitoring systems. 4,799,174, Cl. 364-550.000.

Krastel, Hermann: *See*—
Gehrung, Hartmut; Krastel, Hermann; and Kirchhuebel, Rainer, 4,798,458, Cl. 351-242.000.

Kreiss, Eberhard: *See*—
Hohlein, Peter; Kreiss, Eberhard; Mory, Franz; and Riberi, Bernd, 4,798,859, Cl. 525-7.000.

Kretschmar, Herbert C.: *See*—
MacBrair, Clifford L., Jr.; Connor, Daniel S.; Kretschmar, Herbert C.; and Cleary, James A., 4,798,907, Cl. 562-583.000.

Kretzschmar, Rolf: *See*—
Lehmann, Hans D.; Kretzschmar, Rolf; and Hahn, Klaus-Juergen, 4,798,811, Cl. 514-159.000.

Krueger, Heinz; Lardon, Hartmut; and Patsch, Manfred, to BASF Aktiengesellschaft. Azo dyes of methylaniline disulfonic acid coupled with naphthylamine sulfonic acid. 4,798,887, Cl. 534-637.000.

Kruk, Stanislaw, to SKF GmbH. Double-row roller bearing assembly. 4,798,482, Cl. 384-571.000.

Krumbock, Reinhard: *See*—
Link, Gerhard; Frohlich, Walter; Krumbock, Reinhard; Prantl, Georg; and Schaffelhofer, Iwo, 4,798,914, Cl. 570-226.000.

Krupp, Michael N.; and Swindell, Archie C., to Pfizer Inc. dl-5-[(2-benzyl-3,4-dihydro-2H-benzopyran-6-yl)methyl]thiazolidine-2,4-dione as an anti-atherosclerosis agent. 4,798,835, Cl. 514-369.000.

Kruse, James W.; and Windle, W. Eric, to Navistar International Transportation Corp. Overload protection for D.C. circuits. 4,799,126, Cl. 361-101.000.

Kruse, Lawrence I., to SmithKline Beckman Corporation. 2-mercaproimidazole dopamine-β-hydroxylase inhibitors. 4,798,843, Cl. 514-392.000.

Kubota, Atsushi: *See*—
Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, 4,799,084, Cl. 355-14.0SH.

Kubota Ltd.: *See*—
Fukuta, Shigemi; Amakasu, Toshinari; Ugata, Ken; and Yoshino, Shoichi, 4,798,615, Cl. 65-4.400.
Hataura, Kiyoshi; and Nagahama, Masahiro, 4,798,183, Cl. 123-279.000.
Nakata, Masaru; and Kitao, Yuichi, 4,798,260, Cl. 180-253.000.

Kucuk, Fikri; and Ayestaran, Luis C., to Schlumberger Technology Corporation. Method for uniquely estimating permeability and skin factor for at least two layers of a reservoir. 4,799,157, Cl. 364-422.000.

Kudija, Charles T., Jr.: *See*—
Wilcox, William W.; and Kudija, Charles T., Jr., 4,798,949, Cl. 250-203.00R.

Kudo, Atsushi: *See*—
Hosoda, Takuya; Adachi, Shoji; and Kudo, Atsushi, 4,798,950, Cl. 250-214.00A.

Kudo, Junichiro: *See*—
Aoki, Tokuei; Kudo, Junichiro; and Kohno, Katsumi, 4,798,767, Cl. 428-412.000.

Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Reinecke, Paul; Hanssler, Gerd; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Sulphenylated carbamic acid esters, a process for their preparation and their use. 4,798,905, Cl. 560-16.000.

Kulicke & Soffa Industries, Inc.: *See*—
Michaud, Gerard H.; Graham, James H.; and Stout, Roger P., 4,797,994, Cl. 29-720.000.

Kulp, Earl F., Jr. Apparatus for forming precisely arcuate cuts in a workpiece. 4,798,506, Cl. 409-179.000.

Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; and Yagi, Shigeki, to Nihon Tokushu Noyaku Seizo K.K. Benzoxazines and herbicidal use. 4,798,620, Cl. 71-95.000.

Kuna, Wayne A.: *See*—
Yoe, Craig S.; Gibson, Michael R.; O'Patka, Dennis J.; and Kuna, Wayne A., 4,798,455, Cl. 351-51.000.

Kung, Patrick C.; and Goldstein, Gideon, to Ortho Pharmaceutical Corporation. Compositions and methods using a monoclonal antibody to a human T cell antigen. 4,798,806, Cl. 436-548.000.

Kuno, Nobuyoshi: *See*—
Inukai, Shinji; Kuno, Nobuyoshi; Takanishi, Hiroyoshi; and Sasaki, Hiroki, 4,799,135, Cl. 362-296.000.

Kunz, Daniel A.: *See*—
Harder, Patricia A.; and Kunz, Daniel A., 4,798,792, Cl. 435-119.000.

Kurebayashi, Masaaki: *See*—
Yamada, Masamichi; Kurebayashi, Masaaki; Saito, Masakatsu; Yanagihara, Hitoshi; Konishi, Katsuo; and Tsuchiya, Toshio, 4,799,118, Cl. 360-125.000.

Kurimoto, Takashi: *See*—
Nakamura, Moritaka; and Kurimoto, Takashi, 4,798,650, Cl. 156-643.000.

Kuroki, Yuzuru: *See*—
Satoh, Isao; Ichinose, Makoto; Fukushima, Yoshihisa; Kuroki, Yuzuru; and Takagi, Yuuji, 4,799,208, Cl. 369-100.000.

Kurosaki, Toshiei: *See*—
Moriyama, Shigeo; Kurosaki, Toshiei; Terasawa, Tsuneo; Okazaki, Shinji; and Kawamura, Yoshio, 4,798,470, Cl. 356-401.000.

Kurpiella, Hubertus: *See*—
Schmalfuss, Harald; Sinsel, Friedel; and Kurpiella, Hubertus, 4,798,964, Cl. 250-560.000.

Kurzweil Applied Intelligence, Inc.: *See*—
Feldman, Joel A.; Ganong, William F., III; and Bradner, Scott, 4,799,262, Cl. 381-43.000.

Kusumoto, Toshihiko: *See*—
Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, 4,799,084, Cl. 355-14.0SH.

Kuwa, Tadahiro: *See*—
Kanazawa, Yasunori; Arai, Haruo; and Kuwa, Tadahiro, 4,799,123, Cl. 360-133.000.

Kuwano, Yukinori: *See*—
Matsuyama, Takao; Tarui, Hisaki; Tsuda, Shinya; Nakano, Shoichi; and Kuwano, Yukinori, 4,799,087, Cl. 357-4.000.

La Spirotechnique Industrielle et Commerciale: *See*—
Chambonnet, Bernard, 4,798,202, Cl. 128-204.260.

La Barge, Steven B.; and Stanger, Leon J., to Grass Valley Group, Inc., The. Multifunction amplifier. 4,799,026, Cl. 330-254.000.

LaConte, Dennis B. Pre-cooler apparatus and method for increasing ice maker output. 4,798,061, Cl. 62-348.000.

LaCour Incorporated: *See*—
LaCour, Paul M., 4,798,423, Cl. 312-195.000.

LaCour, Paul M., to LaCour Incorporated. Modular desk system. 4,798,423, Cl. 312-195.000.

Ladd, Judith A.; and Miller, Michael J., to GTE Products Corporation. Process for recovering chromium and other metal values from chromium bearing material. 4,798,708, Cl. 423-55.000.

Laempe, Joachim. Apparatus for making molding sand. 4,798,471, Cl. 366-65.000.

Laeuppi, Heinrich; and Rapp, Paul, to Thoma, Erhard. Apparatus for insertion of reinforcement rods in a concrete road surface. 4,798,495, Cl. 404-100.000.

LaFleur, Arnie: *See*—
LaFleur, Arthur E.; LaFleur, Arnie; and LaFleur, Lee, 4,798,572, Cl. 493-195.000.

LaFleur, Arthur E.; LaFleur, Arnie; and LaFleur, Lee, to Custom Packaging Systems, Inc. Collapsible bag and method. 4,798,572, Cl. 493-195.000.

LaFleur, Lee: *See*—
LaFleur, Arthur E.; LaFleur, Arnie; and LaFleur, Lee, 4,798,572, Cl. 493-195.000.

Lagain, Georges, to FMC Corporation. Machine for the manufacture and stacking of bags, pouches and the like made from a thermoplastic material. 4,798,573, Cl. 493-204.000.

Lagarde, Gilles, to Sanofi. Process for the treatment of milk for cheesemaking. 4,798,726, Cl. 426-40.000.

Lagergren, Peter J.; and Roh, David J., to Pandel Instruments, Inc. Flowmeter for use in a flow monitoring system. 4,798,092, Cl. 73-861.770.

Lagerstedt, Jan; and Martensson, Kjell, to AB Tetra Pak. Packing container provided with a reclosable opening arrangement. 4,798,296, Cl. 206-631.200.

La Haye, John L.: *See*—
Jorgensen, Allen R.; Belongia, Larry P.; Gordon, Kenneth A.; and La Haye, John L., 4,798,350, Cl. 242-64.000.

Lai, Ta-Wang; and Vijayendran, Bheema R., to Air Products and Chemicals, Inc. Compositions containing high molecular weight poly(vinylamines) for enhanced oil recovery. 4,798,871, Cl. 525-328.200.

Lakeside Equipment: *See*—
Huntington, Clyde, 4,798,673, Cl. 210-629.000.

Lakshmanan, Vaikuntam I.; Melnbardis, Dzinsars; and Geisler, Robert A., to Carbovan Inc. Process for treatment of flyash. 4,798,709, Cl. 423-63.000.

Lam, Sheir C. Electronic photoflash control circuit. 4,798,996, Cl. 315-241.00P.

Lamerie, N.V.: *See*—
Perovetz, Lawrence M.; Pickthall, Jack, deceased; and Pickthall, Terence, executor, 4,798,626, Cl. 106-123.000.

Lance, Roger L.: *See*—
Meyer, Stephen C.; Lance, Roger L.; Hetzler, Connie L.; Dunkerly, Cedric A., II; Roesaler, Thomas H.; Zenker, David L.; and Sciaraffa, Michael A., 4,798,603, Cl. 604-378.000.

Landis, John M.: *See*—
Asick, John C.; Landis, John M.; and Yingst, Stephen M., 4,798,542, Cl. 439-188.000.

Lang, Manfred; and Hoppler, Walter, to Spinner GmbH, Elektrotechnische Fabrik. Waveguide device for producing absorption or attenuation. 4,799,031, Cl. 333-22.00R.

Langeland, Jan-Age; Gjestrum, Einar; and Bjerkoy, Rolf, to Geco A.S. Arrangement for deployment of seismic cables. 4,798,156, Cl. 114-242.000.

Langner, Carl G., to Shell Oil Company. Seismic float recovery system. 4,798,158, Cl. 114-253.000.

Laramee, Camille A. Disposable warning marker apparatus. 4,798,747, Cl. 428-12.000.

Lardon, Hartmut: *See*—
Krueger, Heinz; Lardon, Hartmut; and Patsch, Manfred, 4,798,887, Cl. 534-637.000.

Larex AG: *See*—
Lauener, Wilhelm F., 4,798,315, Cl. 222-591.000.

LaRue, George S.: *See*—
Lee, Gary M.; Lee, Charles M.; and LaRue, George S., 4,798,978, Cl. 307-450.000.

Laser Applications, Inc.: *See*—
Hess, Albert J., III, 4,798,931, Cl. 219-121.640.

Lassle, Edwin, to Robert Krause GmbH & Co. KG. Ring binder mechanism. 4,798,491, Cl. 402-39.000.

Lasslo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., to Research Corporation. Platelet aggregation inhibitory agents and intermediates therefor. 4,798,830, Cl. 514-314.000.

Lauener, Wilhelm F., to Larex AG. Casting nozzle consisting of several parts for feeding molten metal into the mold of a continuous casting machine. 4,798,315, Cl. 222-591.000.

Laurent, Pierre A., to Thomson-CSF. Method and device for symbol synchronization and their application to the symbol demodulation of digital messages. 4,799,241, Cl. 375-113.000.

Laus, Guy G., to Exxon Chemical Patents Inc. Disposable liquid-absorbent products. 4,798,602, Cl. 604-372.000.

Lausberg, Dietrich; Blinne, Gerd; Ittemann, Peter; Heinz, Gerhard; Seiler, Erhard; and Knoll, Manfred, to BASF Aktiengesellschaft. Thermoplastic molding materials. 4,798,855, Cl. 523-435.000.

Lautenschlager, Karl, Jr., to Karl Lautenschlager KG Mobelbeschlagfabrik. Sheet metal insert cup for cabinet hinges having a mortise centering mechanism. 4,797,972, Cl. 16-382.000.

Laverty, Gerald C., to National Semiconductor Corporation. Adjustable shipping tray. 4,798,305, Cl. 220-22.300.

Layton, James E., to Applied Automation, Inc. Recirculating analog to digital converter with auto-calibrating feature. 4,799,041, Cl. 341-120.000.

Lazareff, Andre , to Jaeger. Display device, in particular for an automatic gear box. 4,798,161, Cl. 116-28.100.

Lazenby, James E. Concrete bucket assembly rigidly mounted for vertical tilting and rotational movement to a forklift vehicle. 4,798,510, Cl. 414-607.000.

Ledley, Robert S., to National Biomedical Research Foundation. Three-dimensional imaging system. 4,798,210, Cl. 128-660.010.

Lee, Charles M.: *See*—
Lee, Gary M.; Lee, Charles M.; and LaRue, George S., 4,798,978, Cl. 307-450.000.

Lee, Frank D.; Yokota, Takashi; and Arai, Ken-ichi, to DNAX Research Institute of Molecular and Cellular Biology, Inc. cDNA clones coding for polypeptides exhibiting murine interleukin-2 activity. 4,798,789, Cl. 435-68.000.

Lee, Gary M.; Lee, Charles M.; and LaRue, George S., to Gain Electronics Corporation. GAAS FET logic having increased noise margin. 4,798,978, Cl. 307-450.000.

Lee, Gary M.; and Peczalski, Andrzej, to Honeywell Inc. Schottky diode logic for E-mode FET/D-mode FET VLSI circuits. 4,798,979, Cl. 307-450.000.

Leemkuil, Hendrik; and Slyh, Robert E., Jr., to Versa Corporation. Line-shaft conveyor diverter. 4,798,275, Cl. 198-372.000.

Leenheer, Adrianus: *See*—
Morssinkhof, Gerhardus H.; Vogel, Lubbertus; and Leenheer, Adrianus, 4,798,023, Cl. 47-26.000.

Le Floc'H, Christian: *See*—
Bouteyre, Jacques; and Le Floc'H, Christian, 4,798,466, Cl. 356-347.000.

Legrand, Franz; and De Bruycker, Patricia, to Solvay & Cie (Societe Anonyme). Process for the manufacture of a powder for ceramic materials, containing at least one metal oxide. 4,798,710, Cl. 423-69.000.

Lehmann, Hans D.; Kretzschmar, Rolf; and Hahn, Klaus-Juergen, to BASF Aktiengesellschaft. Combination preparation. 4,798,811, Cl. 514-159.000.

Lehmann, Peter: *See*—
Glaus, Heinrich; Lehmann, Peter; Joehr, Hans; and Freiburghaus, Rene , 4,798,231, Cl. 140-119.000.

Lehner, Martin: *See*—
Keller, Heinz; Lehner, Martin; Born, Reinhard; and Lotz, Hans-Georg, 4,798,960, Cl. 250-504.00R.

Leifeld, Ferdinand; and Selker, Hermann G., to Trutzschler GmbH & Co. KG. Textile fiber tuft cleaning apparatus. 4,797,976, Cl. 19-200.000.

Leifheit, Eric S. Fixed fingering device for fretted stringed musical instrument. 4,798,119, Cl. 84-314.00R.

Leiner, Kenneth L.: *See*—
Curtin, James J.; Dorler, Jack A.; Jordy, George J.; and Leiner, Kenneth L., 4,798,976, Cl. 307-441.000.

Leland, John E.; and Martinovich, Robert J., to Phillips Petroleum Company. Zinc titanate in poly (arylene sulfide) compositions. 4,798,863, Cl. 524-413.000.

Lengers, Hans L., to U.S. Textiles Corporation. Padded general purpose mitten and method of fabricating same. 4,797,967, Cl. 15-227.000.

Lenti, Daria: *See*—
Visca, Mario; Boero, Giancarlo; and Lenti, Daria, 4,798,854, Cl. 523-334.000.

Lentz, Carl M.; Gustafson, Bruce L.; and Wehner, Paul S., to Eastman Kodak Company. Catalyst composition and method for selective dehydrogenation. 4,798,911, Cl. 568-747.000.

Leonberger, Frederick J.: *See*—
Rediker, Robert H.; Leonberger, Frederick J.; and Greenwood, Darryl P., 4,798,437, Cl. 350-96.140.

Le Queau, Marcel, to U.S. Philips Corporation. Digital FM demodulator using digital quadrature filter. 4,799,025, Cl. 329-107.000.

Lercher, John S.: *See*—
Jakubowicz, Raymond F.; and Lercher, John S., 4,798,705, Cl. 422-63.000.

Leroux, Francis: *See*—
Clerc-Renaud, Jacques; Leroux, Francis; and Ravier, Dominique, 4,798,662, Cl. 204-290.00R.

L'Esperance, Francis A., Jr., to LRI L.P. Method of laser-sculpture of the optically used portion of the cornea. 4,798,204, Cl. 128-303.100.

Levrai, Roland; Picot, Pascal; and Riquart, Christian, to Bendix France. Tandem brake pressure control valve with pressure-failure-compensating parallel piston. 4,798,127, Cl. 91-530.000.

Levy, Sheldon L., to Electric Power Research Institute, Inc. Molding a glass-plastic composite lens. 4,798,690, Cl. 264-1.700.

Lew, Hyok S. Dual S-tube Coriolis force flowmeter. 4,798,091, Cl. 73-861.380.

Lewis, John W., to Dow Chemical Company, The. Machine and method for opening a filled bag, emptying the bag, and disposing of the empty bag. 4,798,508, Cl. 414-412.000.

Lewis, Paul H.; Dai, Eugene P.; and Holst, Edward H., to Texaco Inc. Catalyst for control of emission of sulfur oxides. 4,798,819, Cl. 502-304.000.

Leybold-heraeus GmbH: *See*—
Heinen, Raymond, 4,799,046, Cl. 340-595.000.
Herklotz, Gunther; and Eligehausen, Hans, 4,798,663, Cl. 204-298.000.
Schmidt, Lothar; and Schumbert, Hans-Joachim, 4,798,521, Cl. 417-295.000.

Li, Hungwen, to International Business Machines Corporation. Table lookup addressing by dichotomy window generation. 4,799,269, Cl. 382-27.000.

Licinvest AG: *See*—
Ackeret, Peter, 4,798,015, Cl. 40-152.100.

Lierke, Ernst-Gunter; Grossbach, Rudolf; Heide, Wolfgang; Flogel, Karl; and Junger, Martin, to Battelle-Institut E.V. Liquid atomizer. 4,798,332, Cl. 239-102.200.

Lilley, Joseph Y.: *See*—
Buffington, Robert D.; and Lilley, Joseph Y., 4,798,460, Cl. 356-124.000.

Lily Corporation: *See*—
Trout, John F., 4,798,502, Cl. 450-269.000.

Lin, Kun-Shan; and Goudie, Kathleen M., to Texas Instruments Incorporated. Low data rate speech encoding employing syllable duration patterns. 4,799,261, Cl. 381-36.000.

Lin, Pao C. Collapsible combined table and chair assembly. 4,798,411, Cl. 297-170.000.

Lindborg, Bjorn G.: *See*—
Johansson, Karl N.; Lindborg, Bjorn G.; and Noren, Jan-Olof, 4,798,833, Cl. 514-262.000.

Lindermann Maschinenfabrik GmbH: *See*—
Adolph, Manfred, 4,798,345, Cl. 241-186.200.

Lindh, Devere: *See*—
Colonel, Richard C.; and Lindh, Devere, 4,798,009, Cl. 36-28.000.

Lindner, Bernard J.; and Lorenz, Harold, to PT Components, Inc. Direct lever acting solenoid released brake mechanism. 4,798,269, Cl. 188-171.000.

Lindovist, Per E.: *See*—
Pyle, Roger A.; and Lindovist, Per E., 4,798,147, Cl. 104-166.000.

Lindqvist, Nils R.: *See*—
Bernhardsson, Sven-Olov; Eriksson, Hans F.; Norberg, Sven P.; Forssell, Lars O. H.; and Lindqvist, Nils R., 4,798,635, Cl. 148-325.000.

Lings, Geoffrey P., to National Research Development Corporation. Components in or for self-powered vehicles. 4,798,254, Cl. 180-58.000.

Link, Gerhard; Frohlich, Walter; Krumbock, Reinhard; Prantl, Georg; and Schaffelhofer, Iwo, to Hoechst Aktiengesellschaft. Process for the production of vinyl chloride through thermal cracking of 1,2-dichloroethane. 4,798,914, Cl. 570-226.000.

Lipinski, Richard J.; and Chang, Kelvin Y., to Mogul Corporation, The. Corrosion inhibiting compositions containing carboxylated phosphonic acids and sequestrants. 4,798,675, Cl. 210-700.000.

Lipinski, Thomas L.; and Goedker, Joseph L., to Checker Machine, Inc. Portable food freezer with internal helical conveyor. 4,798,062, Cl. 62-381.000.

Litt, Irving L., to All Packaging Machinery & Supplies Corp. Continuous band and trim sealing apparatus for poly bags. 4,798,038, Cl. 53-372.000.

Litterst, Thomas: *See*—
Tittgemeyer, Udo; and Litterst, Thomas, 4,798,136, Cl. 101-181.000.

Litton Systems Canada Limited: *See*—
Prince, John C.; and Farrell, James F., 4,799,050, Cl. 340-765.000.

Liu, Christopher S.; Grina, Larry D.; and Kapuscinski, Maria M., to Texaco Inc. Hydrocarbon containing anti-oxidant system. 4,798,678, Cl. 252-50.000.

Liu, Nan-I: *See*—
McCready, Russell J.; Liu, Nan-I; and Tyrell, John A., 4,798,858, Cl. 524-100.000.

Lloyd, Kenneth O.: *See*—
Thomson, Timothy M.; Mattes, M. Jules; Old, Lloyd J.; and Lloyd, Kenneth O., 4,798,790, Cl. 435-7.000.

Lobry, Claude; and Truitt, Didier, to Societe Orega Electronique Et Mecanique. Device for centering preformed components for the flat implantation thereof by means of an automatic setting machine. 4,797,996, Cl. 29-740.000.

Locatelli, Renato: *See*—
Bertelli, Guido; Busi, Patrizia; and Locatelli, Renato, 4,798,857, Cl. 524-93.000.

Locher, Anton: *See*—
Bachhofer, Bruno; and Locher, Anton, 4,798,669, Cl. 210-109.000.

Lockheed Corporation: *See*—
Yaniger, Stuart I., 4,798,685, Cl. 252-500.000.

Lockheed Missiles & Space Company, Inc.: *See*—
Schmidt, Terrence W., 4,798,153, Cl. 114-61.000.
Lodoen, Gary A., to Du Pont de Nemours, E. I., and Company. Spandex formed with a mixture of diamines. 4,798,880, Cl. 528-63.000.
Loeffler, Earl F., to Firestone Tire & Rubber Company, The. Shaping turret. 4,798,276, Cl. 198-378.000.
Logan, David J.: *See*—
Wood, Kenneth O.; and Logan, David J., 4,799,172, Cl. 364-518.000.
Lohscheidt, Klaus: *See*—
Fleischer, Hans-Joachim; Lohscheidt, Klaus; Gorres, Dieter; and Behr, Friedrich, 4,798,631, Cl. 148-3.000.
Lokken, Roger C.; and Young, John B., to Minnesota Mining and Manufacturing Company. Abrasive disc support. 4,798,025, Cl. 51-168.000.
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Townsend, Ted H.; Moore, Clinton L.; and Machnicki, John T., 4,798,175, Cl. 119-155.000.
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Joyce, Peter; and Mackie, David M., 4,798,652, Cl. 162-60.000.
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Close, Ernest F., 4,799,000, Cl. 315-371.000.
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Bremmer, Robert A.; Kovner, Vladimir; and Stone, Dennis C., 4,799,112, Cl. 360-31.000.
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Coates, Donald A.; Manthei, Philip J.; and Allen, Max D., 4,798,424, Cl. 312-257.00R.
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Yamamoto, Hisashi; and Maruoka, Keiji, 4,798,903, Cl. 556-432.000.

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Yoe, Craig S.; Gibson, Michael R.; O'Patka, Dennis J.; and Kuna, Wayne A., 4,798,455, Cl. 351-51.000.

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Wade, Jon P.; and Sodini, Charles G., 4,799,192, Cl. 365-49.000.

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Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,799,227, Cl. 372-46.000.
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Imanaka, Ryoichi, 4,799,206, Cl. 369-44.000.
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Thomson, Timothy M.; Mattes, M. Jules; Old, Lloyd J.; and Lloyd, Kenneth O., 4,798,790, Cl. 435-7.000.

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Hancock, John C.; Dubrul, William R.; and Heyler, Charles J., III, 4,798,584, Cl. 604-93.000.

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Baizer, William X.; Bixler, Robert L., Jr.; Meddaugh, Michael D.; and Wright, Antony P., 4,798,818, Cl. 502-228.000.

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Schmitt, Dieter; and Urban, Manfred, 4,798,627, Cl. 106-2.000.

Meredith, Steven A., to Imtran of Canada. Process and a machine for printing on articles by silk screening. 4,798,135, Cl. 101-40.000.

Merritt, Leander; and Ward, John S., to Eli Lilly and Company. Optionally substituted (3β-9,10-didehydro-2,3-dihydro ergoline as serotonergic function enhancement. 4,798,834, Cl. 514-288.000.

Mery, Jean-Claude: *See*—
Fargier, Eric; and Mery, Jean-Claude, 4,798,268, Cl. 188-71.500.

Mesenich, Gerhard, to Colt Industries Inc. Combined fuel injector and pressure regulator assembly. 4,798,329, Cl. 239-5.000.

Mesko, Charles A.: *See*—
Tekip, Gary L.; and Mesko, Charles A., 4,799,067, Cl. 343-890.000.

Messer Griesheim GmbH: *See*—
Aubry, Nestor; Couder, Armand; and Weverbergh, Andre, 4,798,614, Cl. 62-374.000.

Metroka, Michael P.: *See*—
Walczak, Thomas J.; and Metroka, Michael P., 4,798,975, Cl. 307-350.000.

Meurer, Kurt P.; Waniczek, Helmut; Sylvester, Gerd; and Witte, Josef, to Bayer Aktiengesellschaft. Polyolefinecarboxylic acids, their preparation and their use for preparing polyolefine-polycarbonate block copolymers. 4,798,873, Cl. 525-333.700.

Meyer, Horst: *See*—
Wehinger, Egbert; Meyer, Horst; Knorr, Andreas; and Kazda, Stanislav, 4,798,840, Cl. 514-356.000.

Meyer, Stanley A. Gas generator voltage control circuit. 4,798,661, Cl. 204-228.000.

Meyer, Stephen C.; Lance, Roger L.; Hetzler, Connie L.; Dunkerly, Cedric A., II; Roessler, Thomas H.; Zenker, David L.; and Sciaraffa, Michael A., to Kimberly-Clark Corporation. Absorbent article having a hydrophobic transport layer. 4,798,603, Cl. 604-378.000.

Meyers, William E.: *See*—
Tice, Thomas R.; and Meyers, William E., 4,798,786, Cl. 435-177.000.

Michaud, Gerard H.; Graham, James H.; and Stout, Roger P., to Kulicke & Soffa Industries, Inc. Apparatus for and methods of die bonding. 4,797,994, Cl. 29-720.000.

Microlys S.p.A.: *See*—
Gaiardo, Mario, 4,798,484, Cl. 400-124.000.

Middleton, Ian P.; and Paprotny, Jerzy. Process of crosslinking a polyurethane prosthesis with a haloalkylisocyante. 4,798,607, Cl. 623-1.000.

Miessler, Milan; and Pascual, Rafael, to International Business Machines Corporation. Graphics input tablet with three-dimensional data. 4,798,919, Cl. 178-18.000.

Mijers, Jan W. M.; and Steenhuisen, Johannes E., to Duphar International Research B.V. Device for inward suction of liquid. 4,798,671, Cl. 210-238.000.

Miki, Masayuki: *See*—
Ichikawa, Norio; Itsuji, Takayuki; and Miki, Masayuki, 4,799,018, Cl. 324-465.000.

Miklos, Louis F. Automatic horizontal jigging downrigger. 4,798,021, Cl. 43-19.200.

Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Nagao, Makoto, to Fuji Photo Film Co., Ltd. Surface acoustical wave charge transfer device having a plurality of stationary charge carrier storage portions. 4,799,244, Cl. 377-58.000.

Miles Inc.: *See*—
Brenneman, Allen J.; Buck, Harvey B., Jr.; Pugh, Jerry T.; and Robertson, Steven P., 4,798,577, Cl. 494-67.000.

Miles, Michael; and Tarling, Stephen R., to Avdel Limited, a British Company. Fastener installation apparatus. 4,798,079, Cl. 72-391.000.

Milijasevic, Zoran: *See*—
Maddison, David S.; Skalsky, Michael; Milijasevic, Zoran; Perry, Stephen G.; Holley, Loraine K.; Gotthardt, Gerhard R.; and Richardson, Garry T., 4,798,206, Cl. 128-419.00P.

Milk Marketing Board: *See*—
Ranjith, Heva M. P.; and Thoo, Yin C., 4,798,731, Cl. 426-522.000.

Milkowski, Andrew L.: *See*—
Anders, Robert J.; Cerveny, John G.; and Milkowski, Andrew L., 4,798,729, Cl. 426-326.000.

Miller, Alex E., to Union Oil Company of California. Solid animal feed supplement and method for its production. 4,798,727, Cl. 426-69.000.

Miller, Jack V.; and Miller, Ruth Ellen. Kneeling aid. 4,798,264, Cl. 182-230.000.

Miller, Michael E.: *See*—
Booth, Raymond E.; and Miller, Michael E., 4,798,283, Cl. 198-860.500.

Miller, Michael J.: *See*—
Ladd, Judith A.; and Miller, Michael J., 4,798,708, Cl. 423-55.000.

Miller, Richard A. Sliding glass door latch bar. 4,798,407, Cl. 292-229.000.

Miller, Richard A.: *See*—
Aho, Kenneth A.; Melby, Jeffrey J.; and Miller, Richard A., 4,799,131, Cl. 362-61.000.

Miller, Robert. Vehicle bumper, accessories attachable thereto and combination. 4,798,409, Cl. 293-117.000.

Miller, Ruth Ellen: *See*—
Miller, Jack V.; and Miller, Ruth Ellen, 4,798,264, Cl. 182-230.000.

Milliken Research Corporation: *See*—
Warthen, William P.; and Akhawala, Mohammed I., 4,798,200, Cl. 128-89.00R.

Millman, Allan D.: *See*—
Hetherington, Michael W.; Garner, David P.; and Millman, Allan D., 4,798,613, Cl. 55-52.000.

Mills, John E.: *See*—
Cherry, David A.; Maryanoff, Cynthia A.; Mills, John E.; Olofson, Roy A.; and Rodgers, James D., 4,798,893, Cl. 544-215.000.

Mills, Peter S.; and Long, Geoffrey R., to Blue Circle Industries PLC. Settable mineral clinker compositions. 4,798,628, Cl. 106-104.000.

Milyard, Emmert: *See*—
Shaffer, Don T.; and Milyard, Emmert, 4,798,395, Cl. 280-240.000.

Mims, Charles R., to Mark Industries, Inc. Gas well flow instrumentation. 4,799,169, Cl. 364-510.000.

Mimura, Shigetoshi: *See*—
Fukushima, Shigeyoshi; Uno, Hidehiro; and Mimura, Shigetoshi, 4,798,756, Cl. 428-198.000.

Minagawa, Motonobu; Nakahara, Yutaka; Hirai, Bunji; and Sugibuchi, Kazuo, to Adeka Argus Chemical Co., Ltd. Bis-(2,2,6,6-tetramethylpiperidyl) diimides as light stabilizers for synthetic polymers. 4,798,836, Cl. 524-89.000.

Minakawa, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Wheel suspension system for automobiles. 4,798,396, Cl. 280-673.000.

Minami, Satoyuki: *See*—
Itoyama, Kuniyoshi; Horita, Norihiro; Seki, Shigemi; and Minami, Satoyuki, 4,798,875, Cl. 525-444.000.

Minekane, Tomiharu, to Kabushiki Kaisha Toshiba. Photometric apparatus in automatic chemical analyzer. 4,798,703, Cl. 422-65.000.

Minigrip, Inc.: *See*—
Bentsen, Per, 4,798,041, Cl. 53-468.000.

Minnesota Mining and Manufacturing Company: *See*—
Aho, Kenneth A.; Melby, Jeffrey J.; and Miller, Richard A., 4,799,131, Cl. 362-61.000.
Aho, Kenneth A., 4,799,137, Cl. 362-309.000.
Craighead, Lawrence W.; and Niven, Clarence A., 4,798,642, Cl. 156-252.000.
Everitt, George F.; Johnson, Terence P.; and Pham, Lien-Huong A., 4,798,814, Cl. 501-89.000.
Hall, Kevin P.; and Mott, Andrew W., 4,798,780, Cl. 430-264.000.
Hartman, John, 4,798,544, Cl. 439-404.000.
Lokken, Roger C.; and Young, John B., 4,798,025, Cl. 51-168.000.

Minolta Camera Kabushiki Kaisha: *See*—
Hayama, Koh, 4,799,078, Cl. 354-412.000.
Sasaki, Yoshikazu; and Misawa, Naoya, 4,799,069, Cl. 346-108.000.

Minomo, Shinzoo, to Kabushiki Kaisha Toshiba. Saw oscillator with attenuator for protecting saw element. 4,799,029, Cl. 331-107.00A.

Minoo, Osamu: *See*—
Inoue, Masahide; Ichitsuka, Takeshi; Hirayama, Yasuhiko; Koshikawa, Shozo; Kitaoka, Tateki; Nakabayashi, Nobuo; Takeda, Tatsumichi; and Minoo, Osamu, 4,798,585, Cl. 604-93.000.

Minoura, Mikio: *See*—
Ito, Shoji; and Minoura, Mikio, 4,798,188, Cl. 123-478.000.

Misawa, Naoya: *See*—
Sasaki, Yoshikazu; and Misawa, Naoya, 4,799,069, Cl. 346-108.000.

Misubishi Rayon Co., Ltd.: *See*—
Yamamoto, Takashi; Shimada, Katsuhiko; Murata, Ryuji; Tahara, Yasuteru; Terada, Hiromu; and Sakunaga, Kenichi, 4,798,445, Cl. 350-96.340.

Mita Industrial Co., Ltd.: *See*—
Ujino, Koji; and Fujioka, Tadashi, 4,799,079, Cl. 355-14.0SH.

Mita, Tatsumi, to Koganei Ltd. Double acting cylinder unit. 4,798,128, Cl. 92-59.000.

Mitchell, Joan L.; and Pennebaker, William B., to International Business Machines Corporation. Modified technique for suppression of flicker in interlaced video images. 4,799,105, Cl. 358-160.000.

Mitchell, Richard A.; and Buchanan, Joseph R., to Skotch, Inc. Double block and vent valve system. 4,798,223, Cl. 137-312.000.

Mitchell, Robert D.: *See*—
El-Sayed Lyla M.; Schmidt, Steven P.; Trout, Torence J.; and Mitchell, Robert D., 4,798,778, Cl. 430-115.000.

Mitchell, Terry L.; and Spoolstra, Lawrence J., to Architectural Wall Systems, Inc. Floor-to-ceiling wall system. 4,798,035, Cl. 52-281.000.

Mitel Corporation: *See*—
Skierszkan, Simon J., 4,799,022, Cl. 328-20.000.

Mito, Ikuo, to NEC Corporation. Distributed feedback laser diode comprising an active layer partly adjacent to a waveguide layer. 4,799,226, Cl. 372-45.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujii, Noriaki; Kitamura, Mamoru; and Yamada, Akira, 4,798,946, Cl. 235-492.000.
Hayashi, Osamu; Matsuda, Sadamu; Takahashi, Ichiro; Okamoto, Goro; and Okahashi, Kazuo, 4,798,769, Cl. 428-460.000.
Iio, Tsukasa; Mochizuki, Yoshinori; Fujii, Hiroshi; Genba, Yasusi; and Moriwaki, Hideaki, 4,799,037, Cl. 335-46.000.
Itoh, Tetsuroh, 4,798,929, Cl. 219-69.00W.
Kohara, Masanobu; and Shibata, Hiroshi, 4,799,093, Cl. 357-23.600.
Mori, Satoshi, 4,798,983, Cl. 307-570.000.
Shinkawa, Kiyoshi; Kawahara, Takeshi; Hayakawa, Hideki; and Mori, Masaru, 4,799,162, Cl. 364-436.000.
Shiono, Katsumi; Shinohara, Hideo; Naito, Sadao; and Ikeda, Goroo, 4,799,166, Cl. 364-497.000.
Tanaka, Noriaki, 4,799,051, Cl. 340-811.000.

Mitsubishi Jidousha Kogyo Kabushiki Kaisha: *See*—
Katsumoto, Takehiko; and Kikuchi, Kunio, 4,798,517, Cl. 415-131.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Yonezawa, Toshio; Yamaguchi, Noritake; and Okada, Yasutaka, 4,798,632, Cl. 148-12.70N.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Yasukawa, Eiki; Kihara, Kunio; and Tsuboi, Mayumi, 4,798,773, Cl. 429-192.000.

Mitsubishi Rayon Company Ltd.: *See*—
Nakai, Yoshio; and Tateyama, Masamitsu, 4,798,867, Cl. 525-196.000.

Mitsuboshi Belting, Limited: *See*—
Hoshiro, Takeshi; Matsuo, Mu; and Takano, Hiroshi, 4,798,567, Cl. 474-242.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Yoshitake, Junichi; Kitani, Hiroaki; Kashiwa, Norio; Muranaka, Takeshi; Tominari, Kenichi; and Nagamatsu, Shigeki, 4,798,866, Cl. 525-191.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; and Hosono, Yoichi, 4,798,781, Cl. 430-270.000.
Iimuro, Shigeru; Kitamura, Takashi; and Morimoto, Yoshio, 4,798,654, Cl. 203-94.000.

Mitsumoto, Takashi: *See*—
Kito, Masahiro; Mori, Katsuhiro; and Mitsumoto, Takashi, 4,798,242, Cl. 165-103.000.

Mitsutsuka, Syuichi, to Clarion Co., Ltd. Optimum bias circuit for a convolver. 4,798,988, Cl. 310-313.00R.

Mitutoyo Corporation: *See*—
Suzuki, Mikio, 4,798,004, Cl. 33-172.00E.

Mitutoyo Mfg. Co. Ltd.: *See*—
Nakaya, Tadao; and Ide, Shinji, 4,799,170, Cl. 364-513.000.

Miura, Tatsuhiko; and Uno, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Rider-controlled working machine with four-wheel steering system. 4,798,393, Cl. 280-91.000.

Miyake, Nobuyuki: *See*—
Morohashi, Kazuo; Miyake, Nobuyuki; and Gonda, Tsunemi, 4,798,457, Cl. 351-235.000.

Miyatsuka, Hajime: *See*—
Yamada, Yasuyuki; and Miyatsuka, Hajime, 4,798,755, Cl. 428-141.000.

Miyazaki, Toshihiko: *See*—
Tomida, Yoshinori; Sakai, Kunihiro; Matsuda, Hiroshi; Kawada, Haruki; Eguchi, Ken; Kimura, Toshiaki; Takimoto, Kiyoshi; Saitoh, Kenji; and Miyazaki, Toshihiko, 4,798,740, Cl. 427-43.100.

Miyazaki, Yasumichi; and Koga, Yasunori, to Research Development Corporation. Scanning tunneling microscope installed in electron microscope. 4,798,989, Cl. 310-328.000.

Miyazaki, Yoshihiro: *See*—
Hattori, Etsuo; Iwami, Tomoyuki; Miyazaki, Yoshihiro; and Ohbuchi, Ryutaroh, 4,799,056, Cl. 340-799.000.

Miyazawa, Seiichi; Hara, Toshitami; Nojiri, Hidetoshi; Sekiguchi, Yoshinobu; Hasegawa, Mitsutoshi; and Ikeda, Sotomitsu, to Canon Kabushiki Kaisha. Semiconductor laser array. 4,799,229, Cl. 372-50.000.

Miyoshi, Masayasu: *See*—
Yamaguchi, Yoshinori; Nishiyama, Soichi; Maeda, Norihide; and Miyoshi, Masayasu, 4,797,990, Cl. 29-568.000.
Yamaguchi, Yoshinori; Nishiyama, Soichi; Maeda, Norihide; and Miyoshi, Masayasu, 4,797,991, Cl. 29-568.000.

Miyoshi Oil & Fat Co., Ltd.: *See*—
Kaneko, Tomiatsu; Yokoyama, Kazuaki; and Tsuruoka, Hisashi, 4,798,733, Cl. 426-549.000.

Mizusawa, Nobutoshi: *See*—
Sugata, Hiroyuki; Nakata, Kouhei; Mizusawa, Nobutoshi; Yuasa, Satoshi; Haruta, Masahiro; Hamamoto, Takashi; and Osabe, Kuniji, 4,798,694, Cl. 264-60.000.

Mobil Oil Corporation: *See*—
Hon, Clarence C., 4,798,405, Cl. 285-53.000.

Mobley, Lawrence R., to Samsonite Corporation. Locking trolley for garment bag with hanger retaining pads which inhibit unintended hanger withdrawal. 4,798,289, Cl. 206-287.000.

Mochida, Haruo; and Asano, Yasushi, to Nissan Motor Company, Limited. Shift-lever position indicating device for automatic power transmission. 4,798,160, Cl. 116-28.100.

Mochizuki, Hirohiko: *See*—
Kodama, Yukinori; Mochizuki, Hirohiko; Nakano, Masao; Ohira, Tsuyoshi; and Nomura, Hidenori, 4,799,197, Cl. 365-205.000.

Mochizuki, Yoshinori: *See*—
Iio, Tsukasa; Mochizuki, Yoshinori; Fujii, Hiroshi; Genba, Yasusi; and Moriwaki, Hideaki, 4,799,037, Cl. 335-46.000.

Modine Manufacturing: *See*—
Jarrett, Frank N.; and Munch, John E., Jr., 4,798,241, Cl. 165-109.100.

Modrak, James P.; and Roberts, Owen P., to Hercules Incorporated. Soft water-permeable polyolefin nonwovens having opaque characteristics. 4,798,757, Cl. 428-198.000.

Mogul Corporation, The: *See*—
Lipinski, Richard J.; and Chang, Kelvin Y., 4,798,675, Cl. 210-700.000.

Mohr, Raphael: *See*—
Goor, Daniel; Mohr, Raphael; Haddad, Ihsan A.; and Oliver, William R., 4,798,211, Cl. 128-668.000.

Moldovan, Daniel G.: *See*—
Hazlitt, Lonnie G.; and Moldovan, Daniel G., 4,798,081, Cl. 73-53.000.

Molinazzi, Roberto, to Indexstudio S.a.s. di Molinazzi Roberto & C. Modular support for staircase steps. 4,798,030, Cl. 52-188.000.

Molnar, John P., to Guth Lighting Systems, Inc. Lighting fixture having concave shaped reflector and improved asymmetric light reflection system. 4,799,136, Cl. 362-300.000.

Moltner, Hermann: *See*—
Staat, Karlhans; and Moltner, Hermann, 4,798,071, Cl. 72-97.000.

Momodomi, Masaki: *See*—
Horiguchi, Fumio; Itoh, Yasuo; Ogura, Mitsugi; and Momodomi, Masaki, 4,799,193, Cl. 365-149.000.

Monoflo International, Inc.: *See*—
Rader, Helmut, 4,798,304, Cl. 220-6.000.

Montagnier, Luc; Chamaret, Solange; and Gruest, Jacqueline, to Institut Pasteur. Retrovirus associated with lymphadenopathies and adapted to continuous lines of lymphoblastoid B cells, capable of producing retrovirus continuously and process for their production. 4,798,797, Cl. 435-235.000.

Moody, Ian M.: *See*—
Johnson, Ian M.; Moody, Ian M.; and Flesher, Peter, 4,798,861, Cl. 524-458.000.

Mooney, Brian J. Portable compressed air delivery unit for tires with built-in antifreeze capability. 4,798,233, Cl. 141-38.000.

Moore Business Forms, Inc.: *See*—
Greig, Walter G., 4,798,401, Cl. 282-9.00R.
Moore, Clinton L.: *See*—
Townsend, Ted H.; Moore, Clinton L.; and Machnicki, John T., 4,798,175, Cl. 119-155.000.
Moore, Douglas; and Marcus, Mark E., to Gould Inc. Method of making a single-mode evanescent-wave coupler having reduced wavelength dependence. 4,798,438, Cl. 350-96.150.
Moore, William T.; and Wallace, Kenneth J., to Rank Pullin Controls Limited. Controlling image signals in an imaging apparatus. 4,799,106, Cl. 358-168.000.
Moos, Walter H.: *See*—
Downs, David A.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,798,841, Cl. 514-357.000.
Moran, Edward. Panelizing machine and method for use. 4,798,321, Cl. 228-213.000.
Moreland, David W.: *See*—
Downs, David A.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,798,841, Cl. 514-357.000.
Morency, Maurice, to Ultramafic Technology Inc. Production of elements and compounds by deserpentinization of ultramafic rock. 4,798,717, Cl. 423-648.100.
Morgan, Ellen K.: *See*—
Gould, Francis E.; Morgan, Ellen K.; and Reduker, Stephen D., 4,798,876, Cl. 525-457.000.
Morgan, John D.; Giolma, William H.; and Boucher, Richard, to Texas Instruments Incorporated. High frequency charge pump/integrator circuit. 4,798,973, Cl. 307-296.00R.
Mori, Ikuo, to Fuji Xerox Co., Ltd. Toner layer forming device. 4,799,086, Cl. 355-3.0DD.
Mori, Katsuhiro: *See*—
Kito, Masahiro; Mori, Katsuhiro; and Mitsumoto, Takashi, 4,798,242, Cl. 165-103.000.
Mori, Masaru: *See*—
Shinkawa, Kiyoshi; Kawahara, Takeshi; Hayakawa, Hideki; and Mori, Masaru, 4,799,162, Cl. 364-436.000.
Mori, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Driving circuit for cascode BiMOS switch. 4,798,983, Cl. 307-570.000.
Mori, Shojiro, to Kabushiki Kaisha Toshiba. Transfer circuit for operation test of LSI systems. 4,799,004, Cl. 324-73.00R.
Mori, Yasuharu: *See*—
Tokuno, Masateru; Sawata, Tetsuya; and Mori, Yasuharu, 4,798,110, Cl. 83-13.000.
Mori, Yoshiaki: *See*—
Kimura, Takayoshi; Ojima, Yasuo; and Mori, Yoshiaki, 4,798,532, Cl. 432-210.000.
Morikawa, Anri: *See*—
Hidaka, Hiroyoshi; and Morikawa, Anri, 4,798,897, Cl. 546-139.000.
Morimoto, Yoshio: *See*—
Iimuro, Shigeru; Kitamura, Takashi; and Morimoto, Yoshio, 4,798,654, Cl. 203-94.000.
Morinaga, Masaru: *See*—
Seto, Toshiaki; and Morinaga, Masaru, 4,797,984, Cl. 24-641.000.
Morita, Keiichi, to Kabushiki Kaisha Toshiba. Air conditioner with heat regeneration cycle. 4,798,059, Cl. 62-228.400.
Morita, Kunihiko, to Nippon Thompson Co., Ltd. Sheet-metal type endless rectilinear motion rolling guide unit. 4,798,479, Cl. 384-45.000.
Moriwaki, Hideaki: *See*—
Iio, Tsukasa; Mochizuki, Yoshinori; Fujii, Hiroshi; Genba, Yasusi; and Moriwaki, Hideaki, 4,799,037, Cl. 335-46.000.
Moriyama, Shigeo; Kurosaki, Toshiei; Terasawa, Tsuneo; Okazaki, Shinji; and Kawamura, Yoshio, to Hitachi, Ltd. Pattern printing method and apparatus. 4,798,470, Cl. 356-401.000.
Morohashi, Kazuo; Miyake, Nobuyuki; and Gonda, Tsunemi, to Nikon Corporation. Self-conscious type eye examining apparatus. 4,798,457, Cl. 351-235.000.
Morssinkhof, Gerhardus H.; Vogel, Lubbertus; and Leenheer, Adrianus, to Stork Perforated Products B.V. Method of controlling environmental conditions in the proximity of vegetation or crops with the aid of protective sheeting, protective sheeting for use in this method, and a protective device comprising sheeting. 4,798,023, Cl. 47-26.000.
Mortimore, David B., to British Telecommunications, plc. Optical fused couplers. 4,798,436, Cl. 350-96.150.
Morton, Arthur W., to Conoco Inc. Method of launching long pipelines. 4,798,500, Cl. 405-158.000.
Morton Thiokol, Inc.: *See*—
Canterberry, J. B.; and Flanigan, David A., 4,798,142, Cl. 102-290.000.
Hendrickson, Roger R., 4,798,637, Cl. 149-20.000.
Mory, Franz: *See*—
Hohlein, Peter; Kreiss, Eberhard; Mory, Franz; and Riberi, Bernd, 4,798,859, Cl. 525-7.000.
Moskin, Jeffery M.: *See*—
Waltzer, Bernard; and Moskin, Jeffery M., 4,799,142, Cl. 364-143.000.
Motorola, Inc.: *See*—
Grover, R. Kent, 4,799,189, Cl. 364-900.000.
Kenoun, Robert, 4,798,093, Cl. 73-708.000.
Scales, Hunter L., III; Moyer, William C.; and Wilson, William D., 4,799,199, Cl. 365-230.000.
Stern, Morton; and Williams, James, 4,799,253, Cl. 379-59.000.
Walczak, Thomas J.; and Metroka, Michael P., 4,798,975, Cl. 307-350.000.
Wood, Thomas E.; and Hughes, Henry G., 4,798,629, Cl. 106-287.160.
Mott, Andrew W.: *See*—
Hall, Kevin P.; and Mott, Andrew W., 4,798,780, Cl. 430-264.000.
Motta, Vincent C., to Warner-Lambert Company. Lockable pivotable razor. 4,797,998, Cl. 30-87.000.
Mountain, David S., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Apparatus and method for static stress measurement in an object. 4,798,477, Cl. 374-45.000.
Moxee Innovations Corporation: *See*—
Matson, Les; and Sela, Richard, 4,798,562, Cl. 474-101.000.
Moyer, William C.: *See*—
Scales, Hunter L., III; Moyer, William C.; and Wilson, William D., 4,799,199, Cl. 365-230.000.
MTS Systems Corporation: *See*—
Haeg, Steven R.; and Kraabel, Mark T., 4,798,088, Cl. 73-669.000.
Muckerheide, Myron C., to Seton Health Care Foundation. Three-dimensional laser driven display apparatus. 4,799,103, Cl. 358-88.000.
Mueller, Herbert: *See*—
Nelson, David C.; Fresh, Michael J.; and Mueller, Herbert, 4,798,554, Cl. 446-222.000.
Werner, Frank; Streu, Joachim; and Mueller, Herbert, 4,798,851, Cl. 521-137.000.
Muhl, Christian: *See*—
Eiermann, Horst W.; and Muhl, Christian, 4,798,917, Cl. 174-72.00R.
Muhlbauer, Ernst. Applicator syringe for a dental compound. 4,798,596, Cl. 604-218.000.
Mukai, Touji: *See*—
Ikeda, Takahide; Watanabe, Atsuo; Mukai, Touji; Odaka, Masanori; and Ogiue, Katsumi, 4,799,098, Cl. 357-43.000.
Mulder, Marcellinus H. V.: *See*—
Roesink, Hendrik D. W.; Smolders, Cornelis A.; Mulder, Marcellinus H. V.; and Koenhen, Dirk M., 4,798,847, Cl. 521-50.000.
Mulla, Hoshang D.: *See*—
Parruck, Bidyut; and Mulla, Hoshang D., 4,799,144, Cl. 364-200.000.
Muller, Horst: *See*—
Gattermann, Bernd; Steenken, Bernhard; Grosse-Scharmann, Franz; and Muller, Horst, 4,798,271, Cl. 192-18.00R.
Muller, Jean-Louis, to Institut de Recherches de la Siderurgie Francaise. Process for detecting defects on a surface by eddy currents and device for carrying out said process. 4,799,010, Cl. 324-240.000.
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Jarrett, Frank N.; and Munch, John E., Jr., 4,798,241, Cl. 165-109.100.
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Ichigaya, Hiroshi; Tagawa, Susumu; Sugii, Yasuoshi; Ando, Masanori; Yamazaki, Jun; Kawada, Yasuo; Kinoshita, Tokuho; Shirahama, Toshio; Ito, Yoshinori; and Munemoto, Eiji, 4,798,992, Cl. 313-406.000.
Murai, Keiichi: *See*—
Honda, Mitsuru; Koike, Atsushi; Ogawa, Kyosuke; and Murai, Keiichi, 4,798,776, Cl. 430-39.000.
Murakami Kaimeido Co: *See*—
Yamana, Tohru; Nakayama, Kiyoshi; and Sato, Kazuhiko, 4,798,967, Cl. 307-10.00R.
Murakami, Yoshihiro, to Sony Corp. Apparatus for processing digital data. 4,799,113, Cl. 360-32.000.
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Muranaka, Takeshi: *See*—
Yoshitake, Junichi; Kitani, Hiroaki; Kashiwa, Norio; Muranaka, Takeshi; Tominari, Kenichi; and Nagamatsu, Shigeki, 4,798,866, Cl. 525-191.000.
Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu; and Sekitani, Noboru, 4,798,348, Cl. 242-35.60E.
Murata, Kiyohito; and Ushijima, Fumihiro, to Toyota Jidosha Kabushiki Kaisha. Hydraulically operated friction clutch having automatic wear compensating valve. 4,798,272, Cl. 192-70.250.
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Yamamoto, Takashi; Shimada, Katsuhiko; Murata, Ryuji; Tahara, Yasuteru; Terada, Hiromu; and Sakunaga, Kenichi, 4,798,445, Cl. 350-96.340.
Murata, Yukio: *See*—
Hisada, Katsutoshi; Kokubu, Nobuaki; Sakurai, Shigeki; Murata, Yukio; and Okano, Tatsuo, 4,799,110, Cl. 358-261.300.
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Nakano, Hiraku; and Murayama, Hiroshi, 4,799,183, Cl. 364-760.000.
Murphy, Deborah C.: *See*—
Powers, Vernon B.; and Murphy, Deborah C., 4,797,992, Cl. 29-600.000.
Murr, Michael R.; Rajasekera, Jay R.; and Vrieland, Bruce C., to American Telephone and Telegraph Company. Method of fabricating a cable. 4,798,641, Cl. 156-158.000.
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Muscanelli, Peter R. Bottle holder. 4,798,286, Cl. 206-150.000.

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Nagahama, Masahiro: *See*—
Hataura, Kiyoshi; and Nagahama, Masahiro, 4,798,183, Cl. 123-279.000.

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Yoshitake, Junichi; Kitani, Hiroaki; Kashiwa, Norio; Muranaka, Takeshi; Tominari, Kenichi; and Nagamatsu, Shigeki, 4,798,866, Cl. 525-191.000.

Nagamoto, Itsushi: *See*—
Nagasaki, Yoichi; Nagamoto, Itsushi; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,798,383, Cl. 273-167.00H.

Nagano, Makoto; Nakanishi, Akira; Hiraki, Tomoyoshi; Ueno, Akira; Takahashi, Shoji; Kobayashi, Shuhei; Yamamoto, Akihiro; and Kodama, Fumio, to Central Glass Company, Limited. Foam glass having crust layer and method of producing same. 4,798,758, Cl. 428-213.000.

Nagao, Makoto: *See*—
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Nagao, Makoto, 4,799,244, Cl. 377-58.000.

Nagaoka, Masaaki: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; and Nagaoka, Masaaki, 4,798,770, Cl. 428-547.000. .

Nagasaka, Hiroko; Hatakoshi, Gen-ichi; Shimada, Naohiro; Yamamoto, Motoyuki; Okajima, Masaki; Iizuka, Yoshio; Kawata, Hatsumi; Kinoshita, Hideaki; and Matsuura, Nobuyuki, to Kabushiki Kaisha Toshiba. Transverse-mode stabilized semiconductor laser diode with slab-coupled waveguide. 4,799,228, Cl. 372-46.000.

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Nagasawa, Hikoshi; Ito, Kazuo; Horii, Shigeru; and Tanoshima, Katsuhide, to Oki Electric Industry Co., Ltd. Optical character reader apparatus. 4,799,271, Cl. 382-40.000.

Nagumo, Akihiko; Ishikawa, Minoru; and Kawada, Ken, to Fuji Photo Film Co., Ltd. Image recording apparatus and method. 4,799,085, Cl. 355-27.000.

Naito, Hiroshi, to Aisin Seiki Kabushiki Kaisha. Electric power steering apparatus. 4,798,253, Cl. 180-79.100.

Naito, Sadao: *See*—
Shiono, Katsumi; Shinohara, Hideo; Naito, Sadao; and Ikeda, Goroo, 4,799,166, Cl. 364-497.000.

Nakabayashi, Kazuto, to Kabushiki Kaisha Toshiba. Method of setting conditions of high-frequency magnetic field. 4,799,014, Cl. 324-314.000.

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Inoue, Masahide; Ichitsuka, Takeshi; Hirayama, Yasuhiko; Koshikawa, Shozo; Kitaoka, Tateki; Nakabayashi, Nobuo; Takeda, Tatsumichi; and Minoo, Osamu, 4,798,585, Cl. 604-93.000.

Nakagawa, Yoshio: *See*—
Matsuishi, Naoto; Nakagawa, Yoshio; Amano, Michiaki; Kakehi, Norihiko; Kawashima, Toshio; and Omura, Shigeki, 4,798,832, Cl. 514-258.000.

Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Hirai, Bunji; and Sugibuchi, Kazuo, 4,798,836, Cl. 524-89.000.

Nakai, Yoshio; and Tateyama, Masamitsu, to Mitsubishi Rayon Company Ltd. Impact resistant thermoplastic resin composition. 4,798,867, Cl. 525-196.000.

Nakajima, Junya: *See*—
Kishimoto, Shinzo; Nishikawa, Toshihiro; Abe, Akira; and Nakajima, Junya, 4,798,784, Cl. 430-382.000.

Nakamura, Keiichi; Tanaka, Tsuneo; Inaguma, Yoshiharu; and Shiratori, Harunori, to Toyoda Koki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Control system for hydraulic tandem pump in motor vehicle. 4,798,050, Cl. 60-329.000.

Nakamura, Kenichiro, to Tsubakimoto Chain Company. Gyratory parabolic antenna driving device. 4,799,064, Cl. 343-766.000.

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Nakamura, Kiyoshi: *See*—
Hirotsu, Tetsuji; Nakamura, Kiyoshi; Kasai, Syoji; Yamaguchi, Hiroshi; and Kozu, Eiji, 4,799,161, Cl. 364-426.010.

Nakamura, Moritaka; and Kurimoto, Takashi, to Fujitsu Limited. Method of dry etching aluminum. 4,798,650, Cl. 156-643.000.

Nakamura, Shinichi: *See*—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,798,680, Cl. 252-299.010.

Nakanishi, Akira: *See*—
Nagano, Makoto; Nakanishi, Akira; Hiraki, Tomoyoshi; Ueno, Akira; Takahashi, Shoji; Kobayashi, Shuhei; Yamamoto, Akihiro; and Kodama, Fumio, 4,798,758, Cl. 428-213.000.

Nakanishi, Nobuyasu: *See*—
Goshima, Takahiro; Hattori, Yoshiyuki; Kinbara, Hiroji; Otsuki, Hiromi; Nomura, Yoshihisa; and Nakanishi, Nobuyasu, 4,799,048, Cl. 340-626.000.

Nakano, Akio. Molding die for use in casting. 4,798,237, Cl. 164-255.000.

Nakano, Hiraku; and Murayama, Hiroshi, to Hitachi Ltd. Vector multiplier having parallel carry save adder trees. 4,799,183, Cl. 364-760.000.

Nakano, Masao: *See*—
Kodama, Yukinori; Mochizuki, Hirohiko; Nakano, Masao; Ohira, Tsuyoshi; and Nomura, Hidenori, 4,799,197, Cl. 365-205.000.

Nakano, Shoichi: *See*—
Matsuyama, Takao; Tarui, Hisaki; Tsuda, Shinya; Nakano, Shoichi; and Kuwano, Yukinori, 4,799,087, Cl. 357-4.000.

Nakano, Yoshiyuki: *See*—
Kamejima, Kohji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Yamamoto, Hiroshi, 4,799,267, Cl. 382-1.000.

Nakashima, Yoshihiro: *See*—
Kikuno, Mitsutoyo; Hirono, Tatsuo; Nakashima, Yoshihiro; and Yoshino, Hirobumi, 4,799,081, Cl. 355-14.00C.

Nakata, Kouhei: *See*—
Sugata, Hiroyuki; Nakata, Kouhei; Mizusawa, Nobutoshi; Yuasa, Satoshi; Haruta, Masahiro; Hamamoto, Takashi; and Osabe, Kuniji, 4,798,694, Cl. 264-60.000.

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Nakauchi, Shunsaku, to Kokusai Gijutsu Kaihatsu Kabushiki Kaisha. Electrically controlled type cylinder for locks. 4,798,068, Cl. 70-276.000.

Nakaya, Masao: *See*—
Sugino, Kenji; Yanaida, Katsuya; Sugino, Hiroshi; Nakaya, Masao; Nishida, Nobuo; and Eda, Kensaku, 4,798,339, Cl. 239-601.000.

Nakaya, Tadao; and Ide, Shinji, to Mitutoyo Mfg. Co. Ltd.; and Shimizu Kiden Co., Ltd. Method of measuring by coordinate measuring instrument. 4,799,170, Cl. 364-513.000.

Nakayama, Kiyoshi: *See*—
Yamana, Tohru; Nakayama, Kiyoshi; and Sato, Kazuhiko, 4,798,967, Cl. 307-10.00R.

Nanbu, Kazuya; Yamaguchi, Nobuyuki; and Masubuchi, Kaoru, to Daiwa Seiko, Inc. Fishing reel with wear-resistant line guide. 4,798,354, Cl. 242-84.10R.

Napier, James J.: *See*—
Griffith, Ronald C.; and Napier, James J., 4,798,687, Cl. 260-501.100.

Napoleon, David P.; and Centofanti, Salvatore J., to General Felt Industries, Inc. Picker assembly. 4,797,977, Cl. 19-97.000.

Naso, Frank: *See*—
Naso, Michael; and Naso, Frank, 4,798,352, Cl. 242-74.000.

Naso, Michael; and Naso, Frank. Film reel having film-threadable film-retaining core. 4,798,352, Cl. 242-74.000.

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Ledley, Robert S., 4,798,210, Cl. 128-660.010.

National Concrete Masonry Association: *See*—
Pardo, Jorge, 4,798,036, Cl. 52-293.000.

National Research Development Corporation: *See*—
Brown, Richard C., 4,798,850, Cl. 521-134.000.
Davies, Donald W., 4,799,258, Cl. 380-21.000.
Klinner, Wilfred E., 4,798,529, Cl. 425-289.000.
Lings, Geoffrey P., 4,798,254, Cl. 180-58.000.
Matthews, Kim N.; and Fountain, Terence J., 4,799,154, Cl. 364-200.000.

National Semiconductor Corporation: *See*—
Laverty, Gerald C., 4,798,305, Cl. 220-22.300.
Ross, John P., 4,798,649, Cl. 156-552.000.

Navistar International Transportation Corp.: *See*—
Kruse, James W.; and Windle, W. Eric, 4,799,126, Cl. 361-101.000.

NCR Corporation: *See*—
Bruckner, Ronald L.; and Driscoll, James W., 4,798,945, Cl. 235-479.000.
Chen, Paul T. H., 4,799,128, Cl. 361-414.000.
Karim, Mohammad; and Patel, Madhu C., 4,798,428, Cl. 350-96.180.
Porter, Warren W., 4,798,541, Cl. 439-67.000.
Szluk, Nicholas J.; and Fukumoto, Jay T., 4,799,097, Cl. 357-42.000.

Neal, Charles B.: *See*—
Stoughton, John W.; and Neal, Charles B., 4,799,107, Cl. 358-169.000.

Neal, Lewis G.; Haslbeck, John L.; and Tseng, Hsiaopin, to Noxso Corporation. Processes for removing nitrogen oxides, sulfur oxides and hydrogen sulfide from gas streams. 4,798,711, Cl. 423-239.000.

Near, Timothy P.; Cieri, Joseph J.; and Holet, Kenneth M., to General Electric Company. Method for communicating data on a communication network by token passing. 4,799,052, Cl. 340-825.500.

NEC Corporation: *See*—
Fujiwara, Masahiko; Ajisawa, Akira; and Suzuki, Shuji, 4,798,435, Cl. 350-96.130.
Inoue, Yoshiyuki; Takahashi, Masaaki; Tatekura, Koichi; Nishikawa, Hitoshi; Ohta, Hajime; and Kogure, Yoshikazu, 4,798,969, Cl. 307-112.000.
Mito, Ikuo, 4,799,226, Cl. 372-45.000.
Suzuki, Hiroshi, 4,799,215, Cl. 370-60.000.
Yoshida, Yasuharu, 4,799,240, Cl. 375-110.000.

NEC Home Electronics Ltd.: *See*—
Kobayashi, Reiichi, 4,799,102, Cl. 358-23.000.

Neckyfarow, Steven W.: *See*—
Abraham, Dennis G.; Double, Glen P.; and Neckyfarow, Steven W., 4,799,061, Cl. 340-825.340.

Nelson, David C.; Fresh, Michael J.; and Mueller, Herbert. Balloon holder. 4,798,554, Cl. 446-222.000.

Nelson, David E., to Hydroacoustics, Inc. Methods and apparatus for reducing correlation sidelobe interference in seismic profiling systems. 4,799,201, Cl. 367-41.000.

Nelson, Erik K.: *See*—
Beery, Jack; Nelson, Erik K.; and Shelton, John J., 4,798,134, Cl. 100-171.000.

Nelson, Frederic P. Personal identification method. 4,798,403, Cl. 283-70.000.

Nelson, Jeffrey W., to Du Pont de Nemours, E. I., and Company. Preparation of microencapsulated pigment. 4,798,741, Cl. 427-213.330.
Nelson, Marvin A. Game board. 4,798,388, Cl. 273-261.000.
Nelson, Robert T. Easter egg decorating device. 4,798,162, Cl. 118-26.000.
Nelson, Thomas E. Water heater construction and method of making same. 4,798,308, Cl. 220-445.000.
Nennemann, Harry: *See*—
Weller, Klaus; Braun, Walter; and Nennemann, Harry, 4,798,410, Cl. 296-217.000.
Nestec S.A.: *See*—
Steiner, Roland; and Van Meir, Eugene, 4,798,605, Cl. 604-411.000.
Nestler, Eric; and Knight, Thomas F., to Symbolics Inc. Optical Mouse. 4,799,055, Cl. 340-710.000.
Nett, Louis, to Gallina Corporation. Pressurized liquid cooker with integrated radiant heating apparatus. 4,798,939, Cl. 219-438.000.
Neu, Gustav: *See*—
Blumenthal, Gunter; Neu, Gustav; Berger, Karl-Heinz; and Block, Siegmar, 4,798,417, Cl. 299-1.000.
Neumaier, Anton: *See*—
Hoereth, Hans-Jurgen; and Neumaier, Anton, 4,798,249, Cl. 173-14.000.
Neumann, Burkhard; and Stankewitz, Hans-Werner, to Ernst Leitz Wetzlar GmbH. Field stop for dark field illumination in autofocus optical device. 4,798,948, Cl. 250-201.000.
Neuperger, Frank: *See*—
Malcolm, Richard E.; and Neuperger, Frank, 4,798,426, Cl. 350-3.700.
Nevin, Alan: *See*—
Ballard, Denis G. H.; Holmes, Paul A.; Nevin, Alan; Shirley, Ian M.; and Twose, David L., 4,798,742, Cl. 427-240.000.
New West Engineering, Ltd.: *See*—
Harrington, Max G., 4,798,334, Cl. 239-227.000.
Newcomb Spring Corp.: *See*—
Vanmeggelen, Peter; and Jacobson, John, 4,798,072, Cl. 72-132.000.
Newhall, Donald H.; Bullock, Charles D.; and Pilcher, James O., to United States of America, Army. Hydrostatic primary force standard. 4,798,094, Cl. 73-862.580.
Ng, Yee S.: *See*—
Zeise, Eric K.; and Ng, Yee S., 4,799,071, Cl. 346-160.000.
NGK Insulators, Ltd.: *See*—
Hattori, Isao; and Noiri, Hifuo, 4,798,528, Cl. 425-190.000.
Mase, Syunzo; and Soejima, Shigeo, 4,798,693, Cl. 264-44.000.
Oda, Isao; and Soma, Takao, 4,798,493, Cl. 403-404.000.
NHK Spring Co., Ltd.: *See*—
Uozumi, Koji, 4,798,488, Cl. 400-124.000.
Nibby, Chester M., Jr.: *See*—
Barlow, George J.; Keeley, James W.; and Nibby, Chester M., Jr., 4,799,222, Cl. 371-51.000.
Nicolet Corporation: *See*—
Burch, Robert V., 4,799,001, Cl. 318-640.000.
Nicolet Instrument Corporation: *See*—
Crystal, Kevin R., 4,798,478, Cl. 384-12.000.
Nicollini, Germano: *See*—
Confalonieri, Pierangelo; Senderowicz, Daniel; and Nicollini, Germano, 4,799,042, Cl. 341-118.000.
Nielsen, Benny S. Foot regulator, especially for dental equipment. 4,798,535, Cl. 433-101.000.
Nielsen, Robert E., to Grumman Aerospace Corporation. Dynamic system for testing an equipment. 4,799,220, Cl. 371-25.000.
Niemann, Edwin H.: *See*—
Arch, Paul E.; and Niemann, Edwin H., 4,798,749, Cl. 428-36.500.
Niethammer, Kurt: *See*—
Faust, Eberhard; Bossert, Heinz; Niethammer, Kurt; and Ohlhausen, Otto, 4,798,416, Cl. 297-452.000.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; and Yagi, Shigeki, 4,798,620, Cl. 71-95.000.
Niigata Engineering Co., Ltd.: *See*—
Hamada, Shuji, 4,798,027, Cl. 51-310.000.
Nikon Corporation: *See*—
Matsumoto, Koichi; Suenaga, Yutaka; Uehara, Makoto; and Muramatsu, Kiyoyuki, 4,798,962, Cl. 250-548.000.
Morohashi, Kazuo; Miyake, Nobuyuki; and Gonda, Tsunemi, 4,798,457, Cl. 351-235.000.
Ninane, Leon; and Breton, Claude, to Solvay & Cie (Societe Anonyme). Process for the production of salt. 4,797,981, Cl. 23-303.000.
Nippoldt, Robert H.; Rocheleau, Gary A.; and Wright, Thomas C., to Empi, Inc. Safety features for continuous motion therapy system. 4,798,197, Cl. 128-25.00R.
Nippon Chemical Plant Consultant Co., Ltd.: *See*—
Maruko, Saburo, 4,798,192, Cl. 126-91.00A.
Nippon Electric Co., Ltd.: *See*—
Eguchi, Hirotugu, 4,799,101, Cl. 357-59.000.
Nippon Engineer Service Kabushiki Kaisha: *See*—
Sawada, Koji, 4,798,496, Cl. 405-53.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Sakatani, Ikunori; Tanaka, Katsuhiko; and Tamaki, Masaru, 4,798,476, Cl. 384-108.000.
Seto, Toshiaki; and Morinaga, Masaru, 4,797,984, Cl. 24-641.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kishi, Masahichi; Seki, Seizo; and Kanmuri, Noboru, 4,799,257, Cl. 380-9.000.
Nippon Thompson Co., Ltd.: *See*—
Morita, Kunihiko, 4,798,479, Cl. 384-45.000.
Nippondenso Co., Ltd.: *See*—
Goshima, Takahiro; Hattori, Yoshiyuki; Kinbara, Hiroji; Otsuki, Hiromi; Nomura, Yoshihisa; and Nakanishi, Nobuyasu, 4,799,048, Cl. 340-626.000.
Kaga, Hideki; and Kobayashi, Hisanori, 4,798,522, Cl. 417-363.000.
Saitoh, Mitsuhiro, 4,799,047, Cl. 340-618.000.
Nishida, Nobuo: *See*—
Sugino, Kenji; Yanaida, Katsuya; Sugino, Hiroshi; Nakaya, Masao; Nishida, Nobuo; and Eda, Kensaku, 4,798,339, Cl. 239-601.000.
Nishikawa, Hitoshi: *See*—
Inoue, Yoshiyuki; Takahashi, Masaaki; Tatekura, Koichi; Nishikawa, Hitoshi; Ohta, Hajime; and Kogure, Yoshikazu, 4,798,969, Cl. 307-112.000.
Nishikawa, Masaji, to Olympus Optical Co., Ltd. Ion flow electrostatic recording process and apparatus. 4,799,070, Cl. 346-159.000.
Nishikawa, Toshihiro: *See*—
Kishimoto, Shinzo; Nishikawa, Toshihiro; Abe, Akira; and Nakajima, Junya, 4,798,784, Cl. 430-382.000.
Nishino, Haruo: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,798,131, Cl. 99-277.200.
Nishioka, Syoji, to Kabushiki Kaisha Toshiba. Interrupt control system having a processor for determining service priority among a plurality of modules according to an interrupt status table. 4,799,148, Cl. 364-200.000.
Nishiyama, Soichi: *See*—
Yamaguchi, Yoshinori; Nishiyama, Soichi; Maeda, Norihide; and Miyoshi, Masayasu, 4,797,990, Cl. 29-568.000.
Yamaguchi, Yoshinori; Nishiyama, Soichi; Maeda, Norihide; and Miyoshi, Masayasu, 4,797,991, Cl. 29-568.000.
Nishizawa, Jun-ichi, to Zaidan Hojin Handotai Kenkyu Shinkokai. Tunnel injection controlling type semiconductor device controlled by static induction effect. 4,799,090, Cl. 357-12.000.
Nissan Motor Company, Limited: *See*—
Mochida, Haruo; and Asano, Yasushi, 4,798,160, Cl. 116-28.100.
Sakagami, Atsushi; Futami, Toru; Abe, Noriyuki; and Suzuki, Tadashi, 4,799,218, Cl. 370-85.000.
Takase, Sadao; Takeda, Hitoshi; and Isobe, Osamu, 4,798,105, Cl. 74-866.000.
Nitecki, Danute E.: *See*—
McCormick, Francis P.; Wong, Gail L.; Clark, Robin; Arnheim, Norman; and Nitecki, Danute E., 4,798,787, Cl. 435-7.000.
Nitrous Oxide Systems, Inc.: *See*—
Vaznaian, Dale L.; and Thermos, Michael J., 4,798,190, Cl. 123-531.000.
Niven, Clarence A.: *See*—
Craighead, Lawrence W.; and Niven, Clarence A., 4,798,642, Cl. 156-252.000.
Noda, Hideo: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,798,131, Cl. 99-277.200.
Nohara, Shigezo; Hirata, Sadao; Matsuo, Junichi; Hirano, Masami; and Tanikawa, Isao, to Toyo Seikan Kaisha. Process for preparation of injection molded body of olefin/vinyl alcohol copolymer. 4,798,697, Cl. 264-255.000.
Nohira, Hidetaka: *See*—
Takahashi, Takeshi; Tsuzuki, Naoyuki; Nohira, Hidetaka; Omori, Yukimitsu; and Takamura, Akio, 4,798,084, Cl. 73-119.00A.
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, to Canon Kabushiki Kaisha; and Yamakawa Yakuhin Kogyo Kabushiki Kaisha. Optically active compound, process for producing same and liquid crystal composition containing same. 4,798,680, Cl. 252-299.010.
Noiri, Hifuo: *See*—
Hattori, Isao; and Noiri, Hifuo, 4,798,528, Cl. 425-190.000.
Nojiri, Hidetoshi: *See*—
Miyazawa, Seiichi; Hara, Toshitami; Nojiri, Hidetoshi; Sekiguchi, Yoshinobu; Hasegawa, Mitsutoshi; and Ikeda, Sotomitsu, 4,799,229, Cl. 372-50.000.
Nomura, Hidenori: *See*—
Kodama, Yukinori; Mochizuki, Hirohiko; Nakano, Masao; Ohira, Tsuyoshi; and Nomura, Hidenori, 4,799,197, Cl. 365-205.000.
Nomura, Yoshihisa: *See*—
Goshima, Takahiro; Hattori, Yoshiyuki; Kinbara, Hiroji; Otsuki, Hiromi; Nomura, Yoshihisa; and Nakanishi, Nobuyasu, 4,799,048, Cl. 340-626.000.
Norberg, Sven P.: *See*—
Bernhardsson, Sven-Olov; Eriksson, Hans F.; Norberg, Sven P.; Forssell, Lars O. H.; and Lindqvist, Nils R., 4,798,635, Cl. 148-325.000.
Noren, Jan-Olof: *See*—
Johansson, Karl N.; Lindborg, Bjorn G.; and Noren, Jan-Olof, 4,798,833, Cl. 514-262.000.
Noritsu Kenkyu Center Co., Ltd.: *See*—
Yamamoto, Yuji, 4,798,375, Cl. 271-82.000.
North American Philips Corp: *See*—
Bodi, Richard, 4,798,294, Cl. 206-600.000.
Norwich Eaton Pharmaceuticals, Inc.: *See*—
Patel, Vikram S., 4,798,725, Cl. 424-456.000.
Nova Technologies Inc.: *See*—
Chubb, Charles F.; DiMatteo, Paul; and Vaiana, Joseph G., 4,797,960, Cl. 5-81.00R.
Novo Industri A/S: *See*—
Eigtved, Peter, 4,798,793, Cl. 435-134.000.

Nowacki, Christopher; and Brisson, Alfred G., to Trutek Research, Inc. Shroud for coupling kidney stone disintegrator to human body. 4,798,196, Cl. 128-24.00A.

Noxso Corporation: *See*—
Neal, Lewis G.; Haslbeck, John L.; and Tseng, Hsiaopin, 4,798,711, Cl. 423-239.000.

Noyes, Roger A.: *See*—
Kaczmarczyk, Edward T.; Rae, Rory; and Noyes, Roger A., 4,798,511, Cl. 414-686.000.

Nu Aire, Inc.: *See*—
Peters, William F.; and Buchanan, Randall C., 4,798,171, Cl. 119-15.000.

Nulchis, Antonio: *See*—
Bottarelli, Teresio; and Nulchis, Antonio, 4,798,045, Cl. 57-22.000.

Nummi, Pekka: *See*—
Kahkipuro, Matti; Sten, Urpo; Nummi, Pekka; and Hytti, Pekka, 4,799,139, Cl. 363-95.000.

Nuske, Geoffrey G.: *See*—
Hornhardt, Hubert L.; and Nuske, Geoffrey G., 4,798,280, Cl. 198-666.000.

Occidental Chemical Corporation: *See*—
Peterson, John A., 4,798,712, Cl. 423-315.000.

Oculus Optikgeraete GmbH: *See*—
Gehrung, Hartmut; Krastel, Hermann; and Kirchhuebel, Rainer, 4,798,458, Cl. 351-242.000.

Oda, Isao; and Soma, Takao, to NGK Insulators, Ltd. Ceramic-metal composite body. 4,798,493, Cl. 403-404.000.

Oda, Shunri: *See*—
Ishihara, Shunichi; Saito, Keishi; Oda, Shunri; and Shimizu, Isamu, 4,798,167, Cl. 118-723.000.

Odaka, Kentaro: *See*—
Fukami, Tadashi; Ozaki, Shinya; and Odaka, Kentaro, 4,799,221, Cl. 371-38.000.

Odaka, Masanori: *See*—
Ikeda, Takahide; Watanabe, Atsuo; Mukai, Touji; Odaka, Masanori; and Ogiue, Katsumi, 4,799,098, Cl. 357-43.000.

O'Dwyer, James B.: *See*—
Martz, Jonathan T.; O'Dwyer, James B.; Thomas, Stephen J.; and Claar, James A., 4,798,745, Cl. 427-407.100.

Oerlikon Motch Corporation: *See*—
Cherko, Carl F., 4,797,989, Cl. 29-568.000.

Ogasawara, Takeo: *See*—
Hattori, Katsuhiko; Suzuki, Hideyuki; and Ogasawara, Takeo, 4,798,561, Cl. 474-28.000.

Ogawa, Junji, to Fujitsu Limited. Image memory. 4,799,198, Cl. 365-221.000.

Ogawa, Kyosuke: *See*—
Honda, Mitsuru; Koike, Atsushi; Ogawa, Kyosuke; and Murai, Keiichi, 4,798,776, Cl. 430-39.000.

Ogiue, Katsumi: *See*—
Ikeda, Takahide; Watanabe, Atsuo; Mukai, Touji; Odaka, Masanori; and Ogiue, Katsumi, 4,799,098, Cl. 357-43.000.

Ogrodski, Albert V., to Rockwell International Corporation. Monolithic random digital noise generator. 4,799,259, Cl. 380-46.000.

Ogura, Mitsugi; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Method for manufacturing dynamic memory cell. 4,798,794, Cl. 437-41.000.

Ogura, Mitsugi: *See*—
Horiguchi, Fumio; Itoh, Yasuo; Ogura, Mitsugi; and Momodomi, Masaki, 4,799,193, Cl. 365-149.000.

Ohara, Tsunemasa: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,799,074, Cl. 354-173.100.

Ohashi, Masashi: *See*—
Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, 4,799,084, Cl. 355-14.0SH.

Ohata, Isao: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,798,838, Cl. 514-342.000.

Ohbuchi, Ryutaroh: *See*—
Hattori, Etsuo; Iwami, Tomoyuki; Miyazaki, Yoshihiro; and Ohbuchi, Ryutaroh, 4,799,056, Cl. 340-799.000.

Ohira, Tsuyoshi: *See*—
Kodama, Yukinori; Mochizuki, Hirohiko; Nakano, Masao; Ohira, Tsuyoshi; and Nomura, Hidenori, 4,799,197, Cl. 365-205.000.

Ohki, Nobutaka: *See*—
Ishikawa, Takatoshi; Fujimoto, Hiroshi; Ohki, Nobutaka; and Yagihara, Morio, 4,798,783, Cl. 430-372.000.

Ohlhausen, Otto: *See*—
Faust, Eberhard; Bossert, Heinz; Niethammer, Kurt; and Ohlhausen, Otto, 4,798,416, Cl. 297-452.000.

Ohnaka, Michihiro: *See*—
Someya, Shinzo; Akahira, Rokuro; Horino, Hiroshi; Ohnaka, Michihiro; and Kiuchi, Takashi, 4,798,618, Cl. 71-92.000.

Ohta, Hajime: *See*—
Inoue, Yoshiyuki; Takahashi, Masaaki; Tatekura, Koichi; Nishikawa, Hitoshi; Ohta, Hajime; and Kogure, Yoshikazu, 4,798,969, Cl. 307-112.000.

Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, to Suntory Limited; and Kansai Chemical Engineering Co., Ltd. Method and apparatus for tartars separation. 4,798,131, Cl. 99-277.200.

Ohuchi, Chidane, to Canon Kabushiki Kaisha. Interference apparatus for detecting state of wave surface. 4,798,468, Cl. 356-351.000.

Ohyama, Masao, to Sony Corporation. Magnetic tape cassette loading system in recording and/or reproducing apparatus. 4,799,117, Cl. 360-96.500.

Oikawa, Yasunobu: *See*—
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,799,127, Cl. 361-321.000.

Ojima, Yasuo: *See*—
Kimura, Takayoahi; Ojima, Yasuo; and Mori, Yoshiaki, 4,798,532, Cl. 432-210.000.

Okabe Co., Ltd.: *See*—
Yamada, Kunimitsu, 4,798,499, Cl. 405-286.000.

Okabe, Yoshio; Arai, Fumio; and Kodama, Hisashi, to Aisin Seiki Kabushiki Kaisha. Self-contained hydraulic lash adjuster. 4,798,180, Cl. 123-90.580.

Okabe, Yoshio; Kobayashi, Yukimori; Ishikawa, Makoto; Kamiya, Tamotsu; and Atsumi, Tomiaki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Self-contained type automatic belt tensioner. 4,798,563, Cl. 474-110.000.

Okada, Keisuke: *See*—
Tada, Tetsuo; and Okada, Keisuke, 4,799,009, Cl. 324-158.00P.

Okada, Minoru: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,798,838, Cl. 514-342.000.

Okada, Reisuke; and Fujino, Hisami, to Toray Industries, Inc. Laminate board containing uniformly distributed filler particles and method for producing the same. 4,798,762, Cl. 428-285.000.

Okada, Yasutaka: *See*—
Yonezawa, Toshio; Yamaguchi, Noritake; and Okada, Yasutaka, 4,798,632, Cl. 148-12.70N.

Okada, Yosuke, to Sherwood Medical Company. Catheter obturator. 4,798,591, Cl. 604-164.000.

Okahashi, Kazuo: *See*—
Hayashi, Osamu; Matsuda, Sadamu; Takahashi, Ichiro; Okamoto, Goro; and Okahashi, Kazuo, 4,798,769, Cl. 428-460.000.

Okajima, Masaki: *See*—
Nagasaka, Hiroko; Hatakoshi, Gen-ichi; Shimada, Naohiro; Yamamoto, Motoyuki; Okajima, Masaki; Iizuka, Yoshio; Kawata, Hatsumi; Kinoshita, Hideaki; and Matsuura, Nobuyuki, 4,799,228, Cl. 372-46.000.

Okamoto, Goro: *See*—
Hayashi, Osamu; Matsuda, Sadamu; Takahashi, Ichiro; Okamoto, Goro; and Okahashi, Kazuo, 4,798,769, Cl. 428-460.000.

Okamoto, Hidefumi: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,798,728, Cl. 426-129.000.

Okamoto, Hiroshi; Fushimi, Kimio; and Suzuki, Susumu, to Kabushiki Kaisha Toshiba. Refrigerating apparatus and control method thereof. 4,798,057, Cl. 62-228.300.

Okamoto, Kenzo; and Kitada, Fumihiko, to Imanishi Kinzoku Kogyo Kabushiki Kaisha. Defrosting circuit switch unit for electronic range. 4,798,970, Cl. 307-119.000.

Okamoto, Yukio; Shinada, Shinichi; Suzuki, Kenkichi; and Kougami, Akihiko, to Hitachi, Ltd. Driving apparatus for a gas discharge display panel. 4,799,058, Cl. 340-811.000.

Okano, Tetsuo: *See*—
Hisada, Katsutoshi; Kokubu, Nobuaki; Sakurai, Shigeki; Murata, Yukio; and Okano, Tatsuo, 4,799,110, Cl. 358-261.300.

Okazaki, Shinji: *See*—
Moriyama, Shigeo; Kurosaki, Toshiei; Terasawa, Tsuneo; Okazaki, Shinji; and Kawamura, Yoshio, 4,798,470, Cl. 356-401.000.

Oki Electric Industry Co., Ltd.: *See*—
Nagasawa, Hikoshi; Ito, Kazuo; Horii, Shigeru; and Tanoshima, Katsuhide, 4,799,271, Cl. 382-40.000.

Okuda, Chikaaki: *See*—
Tachi, Kazuyuki; Okuda, Chikaaki; Yamada, Katsunori; Oyama, Yoichi; and Suzuki, Shoichi, 4,798,335, Cl. 239-296.000.

Olah, Benjamin, to California Industrial Products, Inc. Sheet metal U-nut. 4,798,507, Cl. 411-175.000.

Old, Lloyd J.: *See*—
Thomson, Timothy M.; Mattes, M. Jules; Old, Lloyd J.; and Lloyd, Kenneth O., 4,798,790, Cl. 435-7.000.

O'Leary, William J.; Hartnett, Thomas J., Jr.; and Jones, Richard G., to Medical Technology Products, Inc. Intravenous infusion pumping system including independent pump set. 4,798,590, Cl. 604-153.000.

Oliver, William R.: *See*—
Goor, Daniel; Mohr, Raphael; Haddad, Ihsan A.; and Oliver, William R., 4,798,211, Cl. 128-668.000.

Olofson, Roy A.: *See*—
Cherry, David A.; Maryanoff, Cynthia A.; Mills, John E.; Olofson, Roy A.; and Rodgers, James D., 4,798,893, Cl. 544-215.000.

Olympus Optical Co., Ltd.: *See*—
Fujiwara, Hiroshi, 4,798,451, Cl. 350-522.000.
Hosoya, Takamasa; and Kimura, Kenji, 4,799,104, Cl. 358-98.000.
Nishikawa, Masaji, 4,799,070, Cl. 346-159.000.

Omori, Yukimitsu: *See*—
Takahashi, Takeshi; Tsuzuki, Naoyuki; Nohira, Hidetaka; Omori, Yukimitsu; and Takamura, Akio, 4,798,084, Cl. 73-119.00A.

Omron Tateisi Electronics Co.: *See*—
Ueda, Kenji, 4,799,043, Cl. 340-825.060.

Omura, Shigeki: *See*—
Matsuishi, Naoto; Nakagawa, Yoshio; Amano, Michiaki; Kakehi, Norihiko; Kawashima, Toshio; and Omura, Shigeki, 4,798,832, Cl. 514-258.000.

Omuron Tateishi Electronics Co.: *See—*
Yamana, Tohru; Nakayama, Kiyoshi; and Sato, Kazuhiko, 4,798,967, Cl. 307-10.00R.

Ondetti, Miguel A.: *See—*
Delaney, Norma G.; Gordon, Eric M.; and Ondetti, Miguel A., 4,798,904, Cl. 558-254.000.

Onishi, Yasushi: *See—*
Tanaka, Kunio; Takegahara, Takashi; and Onishi, Yasushi, 4,799,143, Cl. 364-191.000.

Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, to TDK Corporation. Semiconductive ceramic composition and semiconductor ceramic capacitor. 4,799,127, Cl. 361-321.000.

Ono Sokki Co., Ltd.: *See—*
Takahashi, Takeshi; Tsuzuki, Naoyuki; Nohira, Hidetaka; Omori, Yukimitsu; and Takamura, Akio, 4,798,084, Cl. 73-119.00A.

Onoda, Hiroshi; Sakakibara, Kenji; and Akao, Michitoshi, to Brother Kogyo Kabushiki Kaisha. Electronic typewriter with a detector switch. 4,798,485, Cl. 400-54.000.

Ookawa, Norio: *See—*
Akimoto, Taizo; Akisada, Masahide; Seiki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,799,072, Cl. 354-76.000.

Oomura, Seiji; Fukami, Kashirou; Inagaki, Masao; and Hamamoto, Tooru, to Toyota Jidosha Kabushiki Kaisha. System for controlling rotational speed of hydraulically driven cooling fan of internal combustion engine, responsive to engine coolant and also fan propellant temperature. 4,798,177, Cl. 12.3-41.120.

O'Patka, Dennis J.: *See—*
Yoe, Craig S.; Gibson, Michael R.; O'Patka, Dennis J.; and Kuna, Wayne A., 4,798,455, Cl. 351-51.000.

Orbital Sciences Corporation II: *See—*
Dietz, Ronald P.; and Johnson, Jeffrey D., 4,799,140, Cl. 364-140.000.

Orchid Technology: *See—*
Bui, Le, 4,799,150, Cl. 364-200.000.

Oriental Motor Co, Ltd.: *See—*
Matsumoto, Kenji, 4,799,002, Cl. 318-696.000.

Orman, Thelma M.: *See—*
Williams, Ruth L.; and Orman, Thelma M., 4,797,954, Cl. 2-106.000.

Ortho Pharmaceutical Corporation: *See—*
Kung, Patrick C.; and Goldstein, Gideon, 4,798,806, Cl. 436-548.000.

Osabe, Kuniji: *See—*
Sugata, Hiroyuki; Nakata, Kouhei; Mizusawa, Nobutoshi; Yuasa, Satoshi; Haruta, Masahiro; Hamamoto, Takashi; and Osabe, Kuniji, 4,798,694, Cl. 264-60.000.

Osawa, Hide, to Ajinomoto General Foods, Inc. Method of stabilizing coffee extract solution. 4,798,732, Cl. 426-542.000.

Osborne, Neal F., to Beecham Group p.l.c. Heterocyclic-methylene-penems. 4,798,828, Cl. 514-192.000.

Oscar Mayer Foods Corporation: *See—*
Anders, Robert J.; Cerveny, John G.; and Milkowski, Andrew L., 4,798,729, Cl. 426-326.000.

Oselladore, Mauro: *See—*
Bottacchi, Stefano; and Oselladore, Mauro, 4,799,224, Cl. 372-38.000.

Osteonics Corp.: *See—*
Averill, Robert G.; and Khowaylo, Alex, 4,798,610, Cl. 623-22.000.

Otis Elevator Company: *See—*
Zepke, Bruce E., 4,799,243, Cl. 377-6.000.

Otis Engineering Corporation: *See—*
Deaton, Thomas M.; and Perkins, Donald H., 4,798,247, Cl. 166-373.000.

Otomo, Kikuo; Yamagushi, Masashi; Ito, Masami; and Tokunaga, Hiroki, to Hodogaya Chemical Co., Ltd. Method for separating a trihalogenobenzene isomer. 4,798,913, Cl. 570-211.000.

Otsuka Kagaku Kabushiki Kaisha: *See—*
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; and Shiroi, Takashi, 4,798,890, Cl. 540-358.000.

Otsuki, Hiromi: *See—*
Goshima, Takahiro; Hattori, Yoshiyuki; Kinbara, Hiroji; Otsuki, Hiromi; Nomura, Yoshihisa; and Nakanishi, Nobuyasu, 4,799,048, Cl. 340-626.000.

Otteson, Jack O., to Dana Corporation. Throttle control assembly for a vehicle speed control unit. 4,798,258, Cl. 180-175.000.

Outboard Marine Corporation: *See—*
Higby, Jeffrey P.; McElroy, Kennedy K.; and Zorc, Philip A., 4,798,548, Cl. 440-78.000.

Outillages Scientifiques et de Laboratoires O.S.L.: *See—*
Sauvan, Gerard, 4,798,218, Cl. 134-74.000.

Overluizen, Gerrit; Van Lierop, Joseph G.; and Van Dongen, Anne-Marie A., to U.S. Philips Corporation. Luminescent quartz glass, method of preparing such a glass and luminescent screen provided with such a glass. 4,798,681, Cl. 252-301.40F.

Oversluizen, Gerrit; and Van Dongen, Anne-Marie A., to U.S. Philips Corporation. Luminescent alumino-silicate and/or alumino-borate glass comprising lanthanum and/or gadolinium and luminescent screen provided with such a glass. 4,798,768, Cl. 428-426.000.

Owens, Thomas L., to United States of America, Energy. Radio frequency coaxial feedthrough. 4,799,036, Cl. 333-260.000.

Oyama, Yoichi: *See—*
Tachi, Kazuyuki; Okuda, Chikaaki; Yamada, Katsunori; Oyama, Yoichi; and Suzuki, Shoichi, 4,798,335, Cl. 239-296.000.

Ozaki, Shinya: *See—*
Fukami, Tadashi; Ozaki, Shinya; and Odaka, Kentaro, 4,799,221, Cl. 371-38.000.

Ozawa, Hiroshi: *See—*
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; and Hosono, Yoichi, 4,798,781, Cl. 430-270.000.

Ozawa, Takashi: *See—*
Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, 4,799,084, Cl. 355-14.0SH.

Packham, Charles C.; White, Robert; and Rogers, Steven, to Gillette Company, The. Dry shavers. 4,797,997, Cl. 30-43.920.

Padinger, Reinhard: *See—*
Herzog, Reinhold; Padinger, Reinhard; Rainer, Hans-Peter; and Schober, Helmo, 4,798,658, Cl. 204-147.000.

Pak, Chong-Il. Wafer segment separator and method. 4,798,645, Cl. 156-344.000.

Palko, Sandor. Extended expansion diesel cycle engine. 4,798,184, Cl. 123-316.000.

Pall Corporation: *See—*
Matkovich, Vlado I., 4,798,676, Cl. 210-767.000.

Palm, John W., to Amoco Corporation. Sulfur recovery plant and process using oxygen. 4,798,716, Cl. 423-574.00R.

Palsulich, William G.: *See—*
Heath, Gary B.; Palsulich, William G.; Manica, Keith J.; and Swan, Jack C., Jr., 4,798,090, Cl. 73-715.000.

Pan, Kee-Chuan; Tyan, Yuan-Sheng; and Vazan, Fridrich, to Eastman Kodak Company. Recording elements comprising write-once thin film alloy layers. 4,798,785, Cl. 430-495.000.

Pandel Instruments, Inc.: *See—*
Lagergren, Peter J.; and Roh, David J., 4,798,092, Cl. 73-861.770.

Paoli, Thomas L.: *See—*
Streifer, William; Burnham, Robert D.; and Paoli, Thomas L., 4,799,223, Cl. 372-24.000.

Paprotny, Jerzy: *See—*
Middleton, Ian P.; and Paprotny, Jerzy, 4,798,607, Cl. 623-1.000.

Pardo, Jorge, to National Concrete Masonry Association. Concrete masonry footer block foundation system and blocks therefor. 4,798,036, Cl. 52-293.000.

Paris, Jean-Marc: *See—*
Barriere, Jean-Claude; Cotrel, Claude; and Paris, Jean-Marc, 4,798,827, Cl. 514-183.000.

Parks, Stephen K., to Medical Innovations Corporation. Gastrostomy feeding device. 4,798,592, Cl. 604-49.000.

Parmley, Robert F.: *See—*
Block, Robert E., 4,798,325, Cl. 239-663.000.

Parr, William J., to Akzo America Inc. Flame resistant organic substances containing polymeric flame retardants. 4,798,860, Cl. 524-409.000.

Parrott, Stephen L., to Phillips Petroleum Company. Hydrocracking catalyst for middle distillates. 4,798,666, Cl. 208-111.000.

Parruck, Bidyut; and Mulla, Hoshang D., to Alcatel USA, Corp. Multifunction communication board for expanding the versatility of a computer. 4,799,144, Cl. 364-200.000.

Particle Measuring Systems, Inc.: *See—*
Knollenberg, Robert G., 4,798,465, Cl. 356-336.000.

Partington, Albert J.; and Hornberger, David A., to Westinghouse Electric Corp. Method for installing integral shroud turbine blading. 4,798,520, Cl. 416-219.00R.

Pascual, Rafael: *See—*
Miessler, Milan; and Pascual, Rafael, 4,798,919, Cl. 178-18.000.

Pask, George, to Rolls-Royce Limited. Nozzle guide vane structure for a gas turbine engine. 4,798,514, Cl. 415-115.000.

Pasquariello, Mark A. Portable hammock support. 4,797,961, Cl. 5-127.000.

Pasquier, Armand, to Etudes Techniques et Realisations (CdF Ingenierie); and Pasquier, Armand. Pneumatic process and device for conveying snow. 4,798,012, Cl. 37-219.000.

Passmore, David A.: *See—*
Rigsby, Donald R.; Dehlinger, James R.; and Passmore, David A., 4,798,076, Cl. 72-352.000.

Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., to Texaco Inc. Separation of organic liquids. 4,798,674, Cl. 210-640.000.

Patel, Madhu C.: *See—*
Karim, Mohammad; and Patel, Madhu C., 4,798,428, Cl. 350-96.180.

Patel, Vikram S., to Norwich Eaton Pharmaceuticals, Inc. Sustained release capsule. 4,798,725, Cl. 424-456.000.

Patil, Ghanshyam: *See—*
Kam, Sheung T.; Matier, William L.; Patil, Ghanshyam; and Mai, Khuong H. X., 4,798,892, Cl. 544-146.000.

Patil, Prabhakar B., to Ford Motor Company. System for computer controlled shifting of an automatic transmission. 4,799,158, Cl. 364-424.100.

Patsch, Manfred: *See—*
Krueger, Heinz; Lardon, Hartmut; and Patsch, Manfred, 4,798,887, Cl. 534-637.000.

Paul, Wollhaf: *See—*
Erwin, Piepka; Paul, Wollhaf; and Subhash, Gandbhir, 4,798,504, Cl. 409-2.000.

Paulet, Jean-Francois, to Swiss Aluminium Ltd. Process for electrolytically dyeing an anodic oxide layer on aluminum or aluminum alloys. 4,798,656, Cl. 204-37.600.

Paulick, David R.: *See*—
Buschur, Jeffrey J.; Paulick, David R.; and Schoen, Roy C., 4,798,102, Cl. 74-600.000.
Paulikas, Arvydas P., to United States of America, Energy. Self-cleaning rotating anode X-ray source. 4,799,249, Cl. 378-125.000.
Paulson, Robert C.: *See*—
Bonomo, Donald J.; and Paulson, Robert C., 4,798,205, Cl. 128-344.000.
Paulus, Wilfried: *See*—
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Reinecke, Paul; Hansaler, Gerd; and Brandes, Wilhelm, 4,798,905, Cl. 560-16.000.
Pavlin, Cyrille F.; and Prevost, Marc, to Bertin & Cie. System for monitoring the geometry of a mechanical structure. 4,798,461, Cl. 356-138.000.
Pavlopoulos, Theodore G.; and Boyer, Joseph H., to United States of America, Navy. Laser dyes derived from bimanes. 4,799,230, Cl. 372-53.000.
Pazicni, Joseph M. Priority planner calendar. 4,798,402, Cl. 283-2.000.
PCT Pyrochemtek AG: *See*—
Eiermann, Horst W.; and Muhl, Christian, 4,798,917, Cl. 174-72.00R.
Pearlman, Fred: *See*—
Khanna, Pyare; and Pearlman, Fred, 4,798,804, Cl. 436-94.000.
Pearlman, Sheldon; Fridland, Anatoly; and Martin, Gunther J., to Kidde, Inc. Phase-coherent FSK signal demodulator. 4,799,239, Cl. 375-88.000.
Pearson, Victor I.; and Spector, George. Shake nail puller. 4,798,366, Cl. 254-22.000.
Peck, Anthony W., to Burroughs Wellcome Co. Benzodiazepine tranquilizer combinations and the use thereof. 4,798,826, Cl. 514-221.000.
Peczalski, Andrzej: *See*—
Lee, Gary M.; and Peczalski, Andrzej, 4,798,979, Cl. 307-450.000.
Peitsmeier, Karl; and Schremmer, Gottfried, to Daimler-Benz Aktiengesellschaft. Steering wheel lock for motor vehicles. 4,798,067, Cl. 70-252.000.
Pelgrom, Marcellinus J. M.: *See*—
Esser, Leonard J. M.; and Pelgrom, Marcellinus J. M., 4,799,109, Cl. 358-213.280.
Penato, Jean M.; Gabbay, Emile; and Debrouwer, Yves, to Thomson-CGR. Rotating anode with graphite for X-ray tube. 4,799,250, Cl. 378-144.000.
Penhasi, Harry A., to Beckman Instruments, Inc. Rotor for centrifuge. 4,798,579, Cl. 494-18.000.
Pennebaker, William B.: *See*—
Mitchell, Joan L.; and Pennebaker, William B., 4,799,105, Cl. 358-160.000.
Pennwalt Corporation: *See*—
Griffith, Ronald C.; and Napier, James J., 4,798,687, Cl. 260-501.100.
Perkin-Elmer Corporation, The: *See*—
Boostrom, Roy E., 4,798,464, Cl. 356-328.000.
Perkins, Donald H.: *See*—
Deaton, Thomas M.; and Perkins, Donald H., 4,798,247, Cl. 166-373.000.
Perkins, Eugene W. Apparatus for frictionally heating liquid. 4,798,176, Cl. 122-26.000.
Perlsweig, Leon. Means for mounting a mini-flashlight on a writing instrument. 4,799,132, Cl. 362-118.000.
Permark Corp. c/o Sci/Med Advances Corp.: *See*—
Sarath, Alan; and Mawhirt, James A., 4,798,582, Cl. 604-47.000.
Perno, Salvatore G.: *See*—
Furbee, Avery D.; Perno, Salvatore G.; and Burke, James E., 4,799,248, Cl. 378-114.000.
Pero, Stephen M.: *See*—
Kaplan, Jonathan I.; and Pero, Stephen M., 4,799,077, Cl. 354-400.000.
Perovetz, Lawrence M.; Pickthall, Jack, deceased; and by Pickthall, Terence, executor, to Lamerie, N.V. Solutions and creams for silver plating and polishing. 4,798,626, Cl. 106-123.000.
Perry, Stephen G.: *See*—
Maddison, David S.; Skalsky, Michael; Milijasevic, Zoran; Perry, Stephen G.; Holley, Loraine K.; Gotthardt, Gerhard R.; and Richardson, Garry T., 4,798,206, Cl. 128-419.00P.
Persohn, Paul H.; and Persohn, Philippe. Device for the protection against freezing of installations for the storage or the supply of a freezing liquid, in particular water. 4,798,239, Cl. 165-45.000.
Persohn, Philippe: *See*—
Persohn, Paul H.; and Persohn, Philippe, 4,798,239, Cl. 165-45.000.
Personal Products Company: *See*—
Marbach, Philip J., 4,798,638, Cl. 156-69.000.
Peters, Alan R.: *See*—
Kozyrski, Vincent T.; and Peters, Alan R., 4,798,112, Cl. 83-455.000.
Peters, Jorg: *See*—
Prochnow, Jurgen; Peters, Jorg; Theis, Ulrich; and Karius, Klaus D., 4,797,985, Cl. 29-1.210.
Peters, William F.; and Buchanan, Randall C., to Nu Aire, Inc. Animal isolator. 4,798,171, Cl. 119-15.000.
Petersen, Steven R.: *See*—
Kramer, L. Jonathan; and Petersen, Steven R., 4,799,174, Cl. 364-550.000.
Peterson, John A., to Occidental Chemical Corporation. Homogeneous mixtures of polyphosphates. 4,798,712, Cl. 423-315.000.
Petri, Alberto, to Enichem Tecnoresine S.p.A. Branched polycarbonate from methylene-bis-naphthalene compound. 4,798,882, Cl. 528-190.000.
Petrini, Grace. Throwaway bib. 4,797,952, Cl. 2-49.00R.
Pettman, Roger B.; and Wells, Nicholas S., to Shell Internationale Research Maatschappij, B.V. Imidazole derivatives, their preparation and their use as fungicides. 4,798,845, Cl. 514-400.000.
Peugh, Jack, to Printpack, Inc. Web slitting system and slack inducing apparatus and method useful therein. 4,798,353, Cl. 242-75.300.
Pezaris, Constantine D., to Environmental Fragrance Technologies, Ltd. Driver circuit. 4,798,935, Cl. 219-272.000.
Pfeifer, Kurt: *See*—
Vohringer, Gerhard F.; and Pfeifer, Kurt, 4,798,340, Cl. 239-692.000.
Pfizer Inc.: *See*—
Krupp, Michael N.; and Swindell, Archie C., 4,798,835, Cl. 514-369.000.
Pfrummer-Viggo GmH+Co. KG: *See*—
Iwatschenko, Peter, 4,798,593, Cl. 604-164.000.
Pham, Lien-Huong A.: *See*—
Everitt, George F.; Johnson, Terence P.; and Pham, Lien-Huong A., 4,798,814, Cl. 501-89.000.
Phillips Petroleum Company: *See*—
Hitzman, Donald O., 4,798,801, Cl. 435-313.000.
Leland, John E.; and Martinovich, Robert J., 4,798,863, Cl. 524-413.000.
Parrott, Stephen L., 4,798,666, Cl. 208-111.000.
Picchi, Emilio: *See*—
Faggian, Lucio; Marcotullio, Armando; Platone, Edoardo; and Picchi, Emilio, 4,798,915, Cl. 585-833.000.
Picel, Zdenek: *See*—
Masson, Jacques L. R.; and Picel, Zdenek, 4,799,179, Cl. 364-724.100.
Picker International, Inc.: *See*—
Furbee, Avery D.; Perno, Salvatore G.; and Burke, James E., 4,799,248, Cl. 378-114.000.
Pickthall, Jack, deceased: *See*—
Perovetz, Lawrence M.; Pickthall, Jack, deceased; and Pickthall, Terence, executor, 4,798,626, Cl. 106-123.000.
Pickthall, Terence, executor: *See*—
Perovetz, Lawrence M.; Pickthall, Jack, deceased; and Pickthall, Terence, executor, 4,798,626, Cl. 106-123.000.
Picot, Pascal: *See*—
Levrai, Roland; Picot, Pascal; and Riquart, Christian, 4,798,127, Cl. 91-530.000.
Pierce, Dean S.: *See*—
Frick, Roger L.; and Pierce, Dean S., 4,798,089, Cl. 73-706.000.
Pierre, Michel: *See*—
Goldstein, Guy; and Pierre, Michel, 4,798,744, Cl. 427-389.900.
Pilcher, James O.: *See*—
Newhall, Donald H.; Bullock, Charles D.; and Pilcher, James O., 4,798,094, Cl. 73-862.580.
Pilling, Roger: *See*—
Martin, Harvey G.; Pilling, Roger; and Hosking, Steven M., 4,798,316, Cl. 232-43.100.
Pinch, David G.; and McGrath, Spencer C., to McGrath, Spencer. Optical reflector system for fluorescent lighting fixtures. 4,799,134, Cl. 362-217.000.
Pinchuk, Leonard, to Corvita Corporation. Reinforcing structure for cardiovascular graft. 4,798,606, Cl. 623-1.000.
Pingaud, Bernard J., to Eastman Kodak Company. Preparation of facetted nodular particles. 4,798,622, Cl. 75-0.5AA.
Pinion, John A. Downspout trap and clean out. 4,798,028, Cl. 52-16.000.
Pizzolato, John: *See*—
Silver, Marc L.; and Pizzolato, John, 4,798,116, Cl. 83-858.000.
Platinum Pen Co., Ltd.: *See*—
Kasai, Kikuo; Kodera, Kimio; and Maki, Mitsuo, 4,798,310, Cl. 221-87.000.
Platone, Edoardo: *See*—
Faggian, Lucio; Marcotullio, Armando; Platone, Edoardo; and Picchi, Emilio, 4,798,915, Cl. 585-833.000.
Platt, Ronald, to Crane Carton Company. Wedge shape carton and blank. 4,798,323, Cl. 229-115.000.
Plavac, Frank; and Wollenberg, Robert H., to Chevron Research Company. Modified succinimides (x). 4,798,612, Cl. 44-63.000.
Ployette, Florimond E., to Inria Institut National de Recherche en Informatique et en Automatique. Electronic circuit constituting an improved high-speed stable memory with memory zones protect from overlap. 4,799,186, Cl. 364-900.000.
Plueddemann, Edwin P.; and Bank, Howard M., to Dow Corning Corporation. Method for stabilizing unsaturated organosilicone compositions. 4,798,889, Cl. 556-401.000.
Plummer, Jan P. Speaker system. 4,799,264, Cl. 381-158.000.
Pohl, Peter: *See*—
Johnson, Alfred H.; Pohl, Peter; Prauer, Heinz; and Schulz, Dietmar, 4,798,430, Cl. 350-96.200.
Polaroid Corporation: *See*—
Kaplan, Jonathan I.; and Pero, Stephen M., 4,799,077, Cl. 354-400.000.
Poldervaart, Leendert, to Single Buoy Moorings, Inc. Mooring device. 4,798,155, Cl. 114-230.000.
Pollock, Paul R.; and Stoneburner, Larry P., to Dana Corporation. Kingpin assembly for a vehicle steering axle. 4,798,394, Cl. 280-96.100.
Polymetallurgical Corporation: *See*—
Dion, Paul A.; and Dair, Roderick L., 4,798,932, Cl. 219-118.000.

Polysar Financial Services, S.A.: *See*—
Scott, Richard L.; Martin, John J.; and Smith, Landon, 4,798,644, Cl. 156-324.000.

POM Incorporated: *See*—
Ward, Seth, II, 4,798,273, Cl. 194-350.000.

Pool, James E.: *See*—
Cunha, Daniel; Brown, Wayne M.; Pool, James E.; and Sheperd, Thomas M., 4,798,141, Cl. 102-293.000.

Porter, Warren W., to NCR Corporation. Right angle electrical connector. 4,798,541, Cl. 439-67.000.

Potter, William D.: *See*—
Rawlings, David A.; and Potter, William D., 4,798,201, Cl. 128-156.000.

Powell, Howard T.: *See*—
Jancaitis, Kenneth S.; and Powell, Howard T., 4,799,233, Cl. 372-70.000.

Powers, Vernon B.; and Murphy, Deborah C., to Hercules Defense Electronics Systems Inc. Method of making a thin film integrated microcircuit. 4,797,992, Cl. 29-600.000.

PPG Industries, Inc.: *See*—
Claar, James A.; Thomas, Stephen J.; and Kindle, Betty J., 4,798,746, Cl. 427-407.100.
Knavish, Leonard A.; and Haskins, David R., 4,798,616, Cl. 65-135.000.
Martz, Jonathan T.; O'Dwyer, James B.; Thomas, Stephen J.; and Claar, James A., 4,798,745, Cl. 427-407.100.

Prantl, Georg: *See*—
Link, Gerhard; Frohlich, Walter; Krumbock, Reinhard; Prantl, Georg; and Schaffelhofer, Iwo, 4,798,914, Cl. 570-226.000.

Prauer, Heinz: *See*—
Johnson, Alfred H.; Pohl, Peter; Prauer, Heinz; and Schulz, Dietmar, 4,798,430, Cl. 350-96.200.

Praught, Ronald B.: *See*—
Barwick, Morris L.; and Praught, Ronald B., 4,798,923, Cl. 200-50.00R.

Preller, Hans-Gorg: *See*—
Eizenhoffer, Alfons; and Preller, Hans-Gorg, 4,799,252, Cl. 379-59.000.

Pressnall, Dale W.; Keller, Michael R.; and Schwartz, Robert E., to John Zink Company. Apparatus for handling ash. 4,798,150, Cl. 110-171.000.

Preston, Keith, to British Telecommunications, plc. Optical component mounting. 4,798,439, Cl. 350-96.200.

Prevost, Marc: *See*—
Pavlin, Cyrille F.; and Prevost, Marc, 4,798,461, Cl. 356-138.000.

Prince, John C.; and Farrell, James F., to Litton Systems Canada Limited. Full color liquid crystal display. 4,799,050, Cl. 340-765.000.

Printpack, Inc.: *See*—
Peugh, Jack, 4,798,353, Cl. 242-75.300.

Prochnow, Jurgen; Peters, Jorg; Theis, Ulrich; and Karius, Klaus D., to Rheinmetall GmbH. Method of applying a metallic guide band to a thin-walled projectile body. 4,797,985, Cl. 29-1.210.

Procomp, Inc.: *See*—
Rushmere, John D., 4,798,653, Cl. 162-168.300.

Procter & Gamble Co., The: *See*—
Castro, Artemio; and Showell, Michael S., 4,798,679, Cl. 252-174.150.
MacBrair, Clifford L., Jr.; Connor, Daniel S.; Kretschmar, Herbert C.; and Cleary, James A., 4,798,907, Cl. 562-583.000.

Professional Tape Converters, Inc.: *See*—
Boyce, Elvin L., 4,797,956, Cl. 2-431.000.

Pross, Elke B.: *See*—
Dammann, Hans O. B.; Pross, Elke B.; Rabe, Gert; Tolksdorf, Wolfgang F. M.; and Zinke, Manfred B., 4,798,434, Cl. 350-96.110.

Protoned B.V.: *See*—
Brauning, Egon, 4,798,358, Cl. 248-161.000.

Prugh, John D.; Hartman, George D.; and Halczenko, Wasyl, to Merck & Co., Inc. Substituted thieno[2,3-B]furan-2-sulfonamides as antiglaucoma agents. 4,798,831, Cl. 514-253.000.

PT Components, Inc.: *See*—
Lindner, Bernard J.; and Lorenz, Harold, 4,798,269, Cl. 188-171.000.

Publishers Equipment Corporation: *See*—
Hermach, Carl J.; and Houy, Duane H., 4,798,137, Cl. 101-211.000.

Puckett, Paul M.: *See*—
Wykowski, Paul L.; and Puckett, Paul M., 4,798,761, Cl. 428-272.000.

Pugh, Jerry T.: *See*—
Brenneman, Allen J.; Buck, Harvey B., Jr.; Pugh, Jerry T.; and Robertson, Steven P., 4,798,577, Cl. 494-67.000.

Pustek, Frank J.: *See*—
Friedman, Robert B.; Gottneid, David J.; Faron, Eugene J.; Pustek, Frank J.; and Katz, Frances R., 4,798,735, Cl. 426-578.000.

Putzig, Donald E., to Du Pont de Nemours, E. I., and Company. Zirconium chelates and their use for cross-linking. 4,798,902, Cl. 556-54.000.

Pyle, Roger A.; and Lindovist, Per E., to SI Handling Systems, Inc. Drive wheel adjuster for driverless vehicle. 4,798,147, Cl. 104-166.000.

Quaker Oats Company, The: *See*—
Schaub, Bernhard; and Taylor, Steven, 4,798,555, Cl. 446-310.000.

Quintana, Ronald P.: *See*—
Lasslo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., 4,798,830, Cl. 514-314.000.

R & R Innovations, Inc.: *See*—
Rodrigues, John G., Jr.; and Rettkowski, Gale, 4,798,151, Cl. 111-73.000.

Rabe, Gert: *See*—
Dammann, Hans O. B.; Pross, Elke B.; Rabe, Gert; Tolksdorf, Wolfgang F. M.; and Zinke, Manfred B., 4,798,434, Cl. 350-96.110.

Racely, Kermit L.: *See*—
Foster, Michael M.; and Racely, Kermit L., 4,798,267, Cl. 187-28.000.

Rader, Helmut, to Monoflo International, Inc. Collapsible box. 4,798,304, Cl. 220-6.000.

Rae, Rory: *See*—
Kaczmarczyk, Edward T.; Rae, Rory; and Noyes, Roger A., 4,798,511, Cl. 414-686.000.

Ragouzis, Perry N. Movable grid drawing frame. 4,798,537, Cl. 434-90.000.

Rainer, Hans-Peter: *See*—
Herzog, Reinhold; Padinger, Reinhard; Rainer, Hans-Peter; and Schober, Helmo, 4,798,658, Cl. 204-147.000.

Rajasekera, Jay R.: *See*—
Murr, Michael R.; Rajasekera, Jay R.; and Vrieland, Bruce C., 4,798,641, Cl. 156-158.000.

Ramm, Eric J., to Australia Nuclear Science & Technology Organisation. Apparatus for forming ceramics. 4,798,524, Cl. 425-77.000.

Rampart Packaging Inc.: *See*—
Kersting, R. James, 4,798,750, Cl. 428-36.700.

Ranford, Alan B., to Sherwood Medical Company. Autotransfusion device. 4,798,578, Cl. 604-4.000.

Ranjith, Heva M. P.; and Thoo, Yin C., to Milk Marketing Board. Heat treatment of fresh liquid milk products. 4,798,731, Cl. 426-522.000.

Rank Pullin Controls Limited: *See*—
Moore, William T.; and Wallace, Kenneth J., 4,799,106, Cl. 358-168.000.

Rank Taylor Hobson Limited: *See*—
Barnaby, Anthony B., 4,798,006, Cl. 33-573.000.

Rankowitz, Marshall M.: *See*—
Scoville, Eugene; Turek, Evan J.; Wragg, Anthony; Cuozzo, Karlina D.; and Rankowitz, Marshall M., 4,798,730, Cl. 426-432.000.

Rantala, Borje, to Instrumentarium Corp. Gas flow constriction module. 4,798,229, Cl. 138-42.000.

Rapp, Paul: *See*—
Lacuppi, Heinrich; and Rapp, Paul, 4,798,495, Cl. 404-100.000.

Rasberger, Michael; Hofmann, Peter; Meier, Hans R.; and Dubs, Paul, to Ciba-Geigy Corporation. Selected 3,9-di(2,2,6,6-tetramethyl-4-piperidyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro [5,5]undecanes. 4,798,822, Cl. 546-15.000.

Ratcliffe, Charles T.; and Ward, John W., to Union Oil Company of California. Process for increasing the selectivity of an alkylation catalyst for monoalkylation. 4,798,816, Cl. 502-62.000.

Rausing, Hans, to AB Tetra Pak. Packing container for liquid contents. 4,798,295, Cl. 206-621.600.

Rauwendaal, Christiaan J. Extruder screw. 4,798,473, Cl. 366-89.000.

Ravier, Dominique: *See*—
Clerc-Renaud, Jacques; Leroux, Francis; and Ravier, Dominique, 4,798,662, Cl. 204-290.00R.

Rawlings, David A.; and Fotter, William D., to Smith and Nephew Associated Companies p.l.c. Surgical adhesive dressing. 4,798,201, Cl. 128-156.000.

Raychem Limited: *See*—
Crofts, David; and Wright, Martin A., 4,799,125, Cl. 361-91.000.
McLoughlin, Robert H.; and Changani, Pushpkumar D., 4,798,752, Cl. 428-36.000.

Raytheon Company: *See*—
Argentini, Dino E., 4,798,643, Cl. 156-295.000.

RCA Licensing Corporation: *See*—
Stoughton, John W.; and Neal, Charles B., 4,799,107, Cl. 358-169.000.

Read, Gary W.: *See*—
deBoer, Wiebe B.; Jensen, Klavs F.; Johnson, Wayne L.; Read, Gary W.; and Robinson, McDonald, 4,798,165, Cl. 118-715.000.

Reale, John, Jr.: *See*—
Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., 4,798,674, Cl. 210-640.000.

Reczek, Werner; and Winnerl, Josef, to Siemens Aktiengesellschaft. Integrated circuit comprising a latch-up protection circuit in complementary MOS-circuitry technology. 4,798,974, Cl. 307-296.00R.

Redel, Dieter G. Process for the production of laminated glass plates. 4,798,695, Cl. 264-164.000.

Rediker, Robert H.; Leonberger, Frederick J.; and Greenwood, Darryl P., to Massachusetts Institute of Technology. Method and apparatus for processing analog optical wave signals. 4,798,437, Cl. 350-96.140.

Redshaw, Digby R.: *See*—
Groves, Michael H.; Redshaw, Digby R.; and Cane, Michael R., 4,798,287, Cl. 206-219.000.

Reduker, Stephen D.: *See*—
Gould, Francis E.; Morgan, Ellen K.; and Reduker, Stephen D., 4,798,876, Cl. 525-457.000.

Reed, Mark A., to Texas Instruments Incorporated. Quantum device output switch. 4,799,091, Cl. 357-12.000.

Rehau AG + Co.: *See*—
Hopperdietzel, Siegfried, 4,798,230, Cl. 138-103.000.

Reifenhauser GmbH & Co. Maschinenfabrik: *See*—
Halter, Hartmut; Zimmermann, Paul H.; and Achterwinter, Norbert, 4,798,351, Cl. 242-65.000.

Reinecke, Paul: *See—*
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,798,899, Cl. 548-262.000.
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Reinecke, Paul; Hanssler, Gerd; and Brandes, Wilhelm, 4,798,905, Cl. 560-16.000.

Reinking, Klaus: *See—*
Hocker, Jurgen; Rottmaier, Ludwig; Reinking, Klaus; Kirsch, Jurgen; and Fullmann, Heinz-Josef, 4,798,686, Cl. 252-500.000.

Renault Agriculture: *See—*
Arbeille, Yves; Drutel, Yves; and Viguier, Alain, 4,799,160, Cl. 364-424.100.

Rengo Co., Ltd.: *See—*
Tokuno, Masateru; Sawata, Tetsuya; and Mori, Yasuharu, 4,798,110, Cl. 83-13.000.

Research Corporation: *See—*
Lasslo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., 4,798,830, Cl. 514-314.000.

Research Development Corporation: *See—*
Miyazaki, Yasumichi; and Koga, Yasunori, 4,798,989, Cl. 310-328.000.

Respirator Research, Ltd.: *See—*
Bartos, Josef A., 4,798,203, Cl. 128-205.220.

Rettkowski, Gale: *See—*
Rodrigues, John G., Jr.; and Rettkowski, Gale, 4,798,151, Cl. 111-73.000.

Reum, Helmut: *See—*
Benedikt, Walter; Heess, Gerhard; Herden, Werner; Friese, Karl-Hermann; Reum, Helmut; Schmatz, Jurgen; and Schwab, Siegbert, 4,798,991, Cl. 313-137.000.

Reuss, Edward L.: *See—*
Hollister, Allen L.; and Reuss, Edward L., 4,799,165, Cl. 364-487.000.

Rexnord Inc.: *See—*
Harmon, Raymond E.; McCown, William R. E.; and Zankich, Frank A., 4,798,408, Cl. 292-341.180.

Rey, Susan P.: *See—*
Boffardi, Bennett P.; and Rey, Susan P., 4,798,683, Cl. 252-389.540.

Rezvani, Behrooz, to General Electric Company. Dual frequency NMR surface coil. 4,799,016, Cl. 324-318.000.

Rheinmetall GmbH: *See—*
Prochnow, Jurgen; Peters, Jorg; Theis, Ulrich; and Karius, Klaus D., 4,797,985, Cl. 29-1.210.

Rhoades, Dean. Combination fishhook and swivel. 4,798,022, Cl. 43-44.830.

Rhone Poulenc Nederlands B.V.: *See—*
Ayad, Hafez M., 4,798,839, Cl. 514-351.000.

Rhone-Poulenc Sante: *See—*
Barriere, Jean-Claude; Cotrel, Claude; and Paris, Jean-Marc, 4,798,827, Cl. 514-183.000.
Berger, Christian, 4,798,895, Cl. 544-41.000.

Riberi, Bernd: *See—*
Hohlein, Peter; Kreiss, Eberhard; Mory, Franz; and Riberi, Bernd, 4,798,859, Cl. 525-7.000.

Rice, Camilla A., to E.C.C. America Inc. Surface modified clays and process of manufacture. 4,798,766, Cl. 428-404.000.

Richardson, Garry T.: *See—*
Maddison, David S.; Skalsky, Michael; Milijasevic, Zoran; Perry, Stephen G.; Holley, Loraine K.; Gotthardt, Gerhard R.; and Richardson, Garry T., 4,798,206, Cl. 128-419.00P.

Richardson, John, to Selectro-Vision, Ltd. Multiple bingo gaming board. 4,798,387, Cl. 273-237.000.

Ricoh Company, Ltd.: *See—*
Kikuno, Mitsutoyo; Hirono, Tatsuo; Nakashima, Yoshihiro; and Yoshino, Hirobumi, 4,799,081, Cl. 355-14.00C.
Yaguchi, Hiroshi; and Sakamoto, Hiroshi, 4,798,820, Cl. 503-207.000.

Riediger, Craig W.: *See—*
Alexander, George F.; Coutant, Alan R.; Fee, David M.; and Riediger, Craig W., 4,798,099, Cl. 74-473.00R.

Riethmann, Hans, Jr.: *See—*
Stauffer, Jorg; and Riethmann, Hans, Jr., 4,798,046, Cl. 57-408.000.

Righele, Giovanni B.; and Scorzato, Giuseppe, to Risco Brevetti S.p.A. Bagging and apportioning machine for sausages and various bagged products. 4,797,973, Cl. 17-33.000.

Rigaby, Donald R.; Dehlinger, James R.; and Passmore, David A., to Benteler Industries, Inc. Nipple forming apparatus. 4,798,076, Cl. 72-352.000.

Rijpers, Johannes C. N.; and De Vrieze, Henricus M., to U.S. Philips Corporation. Low reflectance display device. 4,798,994, Cl. 313-478.000.

Rimmer, James. Beverage cooler. 4,798,063, Cl. 62-457.000.

Ringspann Albrecht Maurer KG: *See—*
Maurer, Ruprecht; and Timtner, Karlheinz, 4,798,559, Cl. 464-38.000.

Riquart, Christian: *See—*
Levrai, Roland; Picot, Pascal; and Riquart, Christian, 4,798,127, Cl. 91-530.000.

Risco Brevetti S.p.A.: *See—*
Righele, Giovanni B.; and Scorzato, Giuseppe, 4,797,973, Cl. 17-33.000.

Ritter, Wolfgang; Handwerk, Hans-Peter; Schlueter, Kaspar; and Hasenjuergen, Heinz, to Henkel Kommanditgesellschaft auf Aktien. Compositions for finishing textiles. 4,797,964, Cl. 8-115.600.

Roach, Thomas A.: *See—*
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Robert Bosch GmbH: *See—*
Benedikt, Walter; Heess, Gerhard; Herden, Werner; Friese, Karl-Hermann; Reum, Helmut; Schmatz, Jurgen; and Schwab, Siegbert, 4,798,991, Cl. 313-137.000.
Bernhardt, Wolfgang; and Tischer, Michael, 4,798,421, Cl. 303-115.000.
Blersch, Eberhard; Burr, August; and Hofmann, Klaus, 4,798,692, Cl. 264-40.600.

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Lassle, Edwin, 4,798,491, Cl. 402-39.000.

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Colin, Joseph F.; Kaercher, Leo T.; and Roberts, Charles D., 4,798,368, Cl. 266-259.000.

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Doerr, Richard E.; Roberts, Margaret A.; and Brown, Harry J., 4,798,279, Cl. 198-594.000.

Roberts, Owen P.: *See—*
Modrak, James P.; and Roberts, Owen P., 4,798,757, Cl. 428-198.000.

Robertson, Steven P.: *See—*
Brenneman, Allen J.; Buck, Harvey B., Jr.; Pugh, Jerry T.; and Robertson, Steven P., 4,798,577, Cl. 494-67.000.

Robinson, Charles F.: *See—*
Weir, Donald H.; and Robinson, Charles F., 4,797,957, Cl. 4-506.000.

Robinson, McDonald: *See—*
deBoer, Wiebe B.; Jensen, Klavs F.; Johnson, Wayne L.; Read, Gary W.; and Robinson, McDonald, 4,798,165, Cl. 118-715.000.

Rocheleau, Gary A.: *See—*
Nippoldt, Robert H.; Rocheleau, Gary A.; and Wright, Thomas C., 4,798,197, Cl. 128-25.00R.

Rockwell International Corporation: *See—*
Ogrodski, Albert V., 4,799,259, Cl. 380-46.000.
Wilcox, William W.; and Kudija, Charles T., Jr., 4,798,949, Cl. 250-203.00R.

Rodgers, James D.: *See—*
Cherry, David A.; Maryanoff, Cynthia A.; Mills, John E.; Olofson, Roy A.; and Rodgers, James D., 4,798,893, Cl. 544-215.000.

Rodrigues, John G., Jr.; and Rettkowski, Gale, to R & R Innovations, Inc. Furrow opening point. 4,798,151, Cl. 111-73.000.

Roesink, Hendrik D. W.; Smolders, Cornelis A.; Mulder, Marcellinus H. V.; and Koenhen, Dirk M., to X-Flow B. V. Process for the preparation of hydrophilic membranes and such membranes. 4,798,847, Cl. 521-50.000.

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Meyer, Stephen C.; Lance, Roger L.; Hetzler, Connie L.; Dunkerly, Cedric A., II; Roessler, Thomas H.; Zenker, David L.; and Sciaraffa, Michael A., 4,798,603, Cl. 604-378.000.

Roetzel, Hartmut, to Cleveland Tramrail International S.A. Suspension means for a running rail of a suspension railway. 4,798,146, Cl. 104-111.000.

Rogers, Lee S.; and Vinal, Albert W., to International Business Machines Corp. Method and apparatus for tolerating track misregistration systems in twin track vertical recording systems. 4,799,115, Cl. 360-66.000.

Rogers, Steven: *See—*
Packham, Charles C.; White, Robert; and Rogers, Steven, 4,797,997, Cl. 30-43.920.

Roh, David J.: *See—*
Lagergren, Peter J.; and Roh, David J., 4,798,092, Cl. 73-861.770.

Rojecki, Walter E., to General Signal Corporation. Fluid brake control system for railroad vehicles. 4,798,420, Cl. 303-38.000.

Rolls-Royce Limited: *See—*
Pask, George, 4,798,514, Cl. 415-115.000.

Rolls-Royce plc: *See—*
Buller, Michael J., 4,798,406, Cl. 285-320.000.
Douglas, Joseph; and Jennings, Richard P., 4,799,190, Cl. 364-900.000.

Rose, Benjamin L., Jr., to American Geodesics, Inc. Domical structure and method for its manufacture. 4,798,032, Cl. 52-81.000.

Rose, Robert C.; and Forrester, Ned C., to Digital Equipment Corporation. Transformation circuit to effect raster operations. 4,799,173, Cl. 364-518.000.

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Frick, Roger L.; and Pierce, Dean S., 4,798,089, Cl. 73-706.000.

Rosen, Johnny; and Wulff, Par, to Triflex Biomarin AB. Plant for fish farming in the open sea. 4,798,169, Cl. 119-3.000.

Rosenthal, Robert D., to Futrex, Inc. Measurement locator and light shield for use in interactance testing of body composition and method for use thereof. 4,798,955, Cl. 250-341.000.

Ross, John P., to National Semiconductor Corporation. Discrete strip taper. 4,798,649, Cl. 156-552.000.

Ross, William M., Jr.: *See—*
Brunton, Ellis W.; Haynes, Denver J.; and Ross, William M., Jr., 4,798,737, Cl. 426-602.000.

Rossi, Renato V.; Starcke, Steven F.; and Swagel, David A., to International Business Machines Corporation. Flexible circuit magnetic core winding for a core member. 4,799,119, Cl. 360-123.000.

Rottmaier, Ludwig: *See—*
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Rougeot, Henri, to Thomson-CSF. Large-format photosensitive device and a method of utilization. 4,799,094, Cl. 357-30.000.
Rouly, Eric: *See*—
Dubuit, Jean-Louis; and Rouly, Eric, 4,798,277, Cl. 198-397.000.
Rouquette, Robert E.: *See*—
Sanderford, H. Britton, Jr.; Rouquette, Robert E.; and Arthur, James D., 4,799,062, Cl. 342-450.000.
Roxas, Ren: *See*—
Haas, Dave; VanderSyde, Gary; Beatty, Paul; and Roxas, Ren, 4,798,040, Cl. 53-460.000.
Roy, Dhirendra C.; Johnson, Roosevelt; and Balazich, Gregory J., to United Technologies Automotive, Inc. Electrical terminal receptacle and electrical component housing adapted for the same. 4,798,545, Cl. 439-677.000.
Rudolf Hausherr & Sohne GmbH & Co. KG: *See*—
Spies, Klaus, 4,798,501, Cl. 405-260.000.
Rushansky, Yuliy: *See*—
Bowden, Wade R., Jr. ; and Rushansky, Yuliy, 4,797,988, Cl. 29-566.400.
Rushmere, John D., to Procomp, Inc. Retention and drainage aid for papermaking. 4,798,653, Cl. 162-168.300.
Russell, Raymond L.: *See*—
Everman, Wayne F.; Klug, Randy J.; and Russell, Raymond L., 4,798,571, Cl. 493-114.000.
Russell, Timothy D.: *See*—
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Russo, Raimondo: *See*—
Gandolfi, Carmelo A.; Spinelli, Silvano; Tofanetti, Odoardo; Russo, Raimondo; and Tognella, Sergio, 4,798,898, Cl. 548-146.000.
Ryan, Richard M. Method for accelerating composting of organic matter and composting reactor therefor. 4,798,802, Cl. 435-313.000.
Sacco, Anthony R.: *See*—
Hardee, Kenneth L.; and Sacco, Anthony R., 4,798,715, Cl. 423-478.000.
Safe Aire, Inc.: *See*—
Jarnagin, Jerry D.; and Dawson, Dennis W., 4,798,034, Cl. 52-169.500.
Sager, James W.: *See*—
Mancini, Alfred A.; Sager, James W.; and Koblish, Theodore R., 4,798,330, Cl. 239-8.000.
Sainato, Anthony, to Creative Products Merchandising. Header sign mounting assemblies for product merchandising displays. 4,798,013, Cl. 40-651.000.
Saito, Cyuichi, to Hitachi, Ltd. Balustrade for a passenger conveyor. 4,798,274, Cl. 198-324.000.
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Saito, Keiji; Takizawa, Yoshiro; and Takagi, Isao, to Kawasaki Steel Techno-Research Corporation. Preheating apparatus employed in analysis of hydrogen and carbon. 4,798,704, Cl. 422-99.000.
Saito, Keishi: *See*—
Ishihara, Shunichi; Saito, Keishi; Oda, Shunri; and Shinizu, Isamu, 4,798,167, Cl. 118-723.000.
Saito, Koichi; Akutsu, Eiichi; Fujimura, Yoshihiko; and Inoue, Nanao, to Fuji Xerox Co., Ltd. Thermal electrostatic ink-jet recording method and an ink therefor. 4,799,068, Cl. 346-1.100.
Saito, Masakatsu: *See*—
Yamada, Masamichi; Kurebayashi, Masaaki; Saito, Masakatsu; Yanagihara, Hitoshi; Konishi, Katsuo; and Tsuchiya, Toshio, 4,799,118, Cl. 360-125.000.
Saitoh, Kenji: *See*—
Tomida, Yoshinori; Sakai, Kunihiro; Matsuda, Hiroshi; Kawada, Haruki; Eguchi, Ken; Kimura, Toshiaki; Takimoto, Kiyoshi; Saitoh, Kenji; and Miyazaki, Toshihiko, 4,798,740, Cl. 427-43.100.
Saitoh, Mitsuhiro, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Liquid level detecting and indicating system with coil type measuring device. 4,799,047, Cl. 340-618.000.
Sakagami, Atsushi; Futami, Toru; Abe, Noriyuki; and Suzuki, Tadashi, to Nissan Motor Company, Limited. Network system. 4,799,218, Cl. 370-85.000.
Sakai, Kunihiro: *See*—
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Sakai, Takamasa, to Dainippon Screen Mfg. Co., Ltd. Method of heating semiconductor and susceptor used therefor. 4,798,926, Cl. 219-10.430.
Sakai, Yoshimi; and Satoh, Yoshiki, to TDK Corporation. Guard panel for tape cassettes and method and apparatus for manufacturing the same. 4,799,120, Cl. 360-132.000.
Sakakibara, Kenji: *See*—
Onoda, Hiroshi; Sakakibara, Kenji; and Akao, Michitoshi, 4,798,485, Cl. 400-54.000.
Sakamoto, Hiroshi: *See*—
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Sakamoto, Yoshio; and Yamazaki, Kaoru, to Kabushiki Kaisha Kenwood. Electroacoustic converter. 4,799,266, Cl. 381-193.000.
Sakata, Masayasu, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic oil for use in sealed-type, lash adjusters. 4,798,179, Cl. 123-90.520.
Sakatani, Ikunori; Tanaka, Katsuhiko; and Tamaki, Masaru, to Nippon Seiko Kabushiki Kaisha. Dynamic pressure type fluid bearing. 4,798,476, Cl. 384-108.000.
Saksena, Anil K.; Wong, Jesse K.; and Mangiaracina, Pietro, to Schering Corporation. Inhibitors of slow reacting substance of anaphylaxis. 4,798,842, Cl. 514-381.000.
Sakui, Koji; and Watanabe, Shigeyoshi, to Kabushiki Kaisha Toshiba. Word line driver for use in a semiconductor memory. 4,798,977, Cl. 307-446.000.
Sakunaga, Kenichi: *See*—
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Sakurai, Akira: *See*—
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Sakurai, Mituko: *See*—
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Salinas, Jorge E.: *See*—
Dunaway, Weyman H.; and Salinas, Jorge E., 4,798,630, Cl. 106-287.100.
Salomon, Mary F., to Lubrizol Corporation, The. Nitrogen containing anti-oxidant compositions. 4,798,684, Cl. 252-47.500.
Salvo, Gaetano. Manual calculator for analog and digital numbers. 4,798,940, Cl. 235-70.00R.
Salzer, Leander J.; and Bergren, Donald A., to United States of America, Energy. Wall thickness measuring method and apparatus. 4,798,002, Cl. 33-125.00A.
Samsonite Corporation: *See*—
Mobley, Lawrence R., 4,798,289, Cl. 206-287.000.
Sanderford, H. Britton, Jr.; Rouquette, Robert E.; and Arthur, James D., to Axonn Corporation. Radio position determination method and apparatus. 4,799,062, Cl. 342-450.000.
Sands, Thomas J. Processes and materials for carrying out microchemical and microbiological tests. 4,798,788, Cl. 435-37.000.
Sano, Tetsuo; Hohki, Tetsuo; Kodama, Eiji; Yoshida, Takumi; Kawatani, Masafumi; and Tsujinaka, Hisayuki, to Dainippon Screen Mfg., Co. System for inspecting pattern defects of printed wiring boards. 4,799,175, Cl. 364-552.000.
Sanofi: *See*—
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Santhouse, Daniel: *See*—
Taylor, David C.; Springer, William E.; Goeller, Loretta; and Santhouse, Daniel, 4,799,124, Cl. 361-42.000.
Santrade Limited: *See*—
Bernhardsson, Sven-Olov; Eriksson, Hans F.; Norberg, Sven P.; Forssell, Lars O. H.; and Lindqvist, Nils R., 4,798,635, Cl. 148-325.000.
Sanyo Electric Co., Ltd.: *See*—
Fujiwara, Masakatsu, 4,799,080, Cl. 355-7.000.
Matsuyama, Takao; Tarui, Hisaki; Tsuda, Shinya; Nakano, Shoichi; and Kuwano, Yukinori, 4,799,087, Cl. 357-4.000.
Sarath, Alan; and Mawhirt, James A., to Permark Corp. c/o Sci/Med Advances Corp. Needle cartridge. 4,798,582, Cl. 604-47.000.
Sarcem S.A.: *See*—
Bonello, Philippe; and Jeanmonod, Maurice, 4,798,598, Cl. 604-280.000.
Sarr, Dennis P., to Boeing Company, The. Ultrasonic 64 channel inspection system with multigate/multimode selection software configurability. 4,799,167, Cl. 364-507.000.
Sarr, Dennis P., to Boeing Company, The. Data recording apparatus for an ultrasonic inspection system. 4,799,168, Cl. 364-507.000.
Sarr, Dennis P., to Boeing Company, The. Ultrasonic instrumentation for examination of variable-thickness objects. 4,799,177, Cl. 364-563.000.
Sartorius GmbH: *See*—
Knothe, Erich; Melcher, Franz-Josef; Maaz, Gunther; Dardat, Klaus; and Sodler, Walter, 4,798,250, Cl. 177-181.000.
Knothe, Erich; Maaz, Gunther; and Handwerk, Volker, 4,798,252, Cl. 177-245.000.
Maaz, Gunther; Bierich, Eduard; and Stadler, Eberhard, 4,798,251, Cl. 177-229.000.
Sarver, Jeffrey M.: *See*—
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Sasaki, Hiroki: *See*—
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Sasaki, Nobukazu: *See*—
Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, 4,799,084, Cl. 355-14.0SH.
Sasaki, Yoshikazu; and Misawa, Naoya, to Minolta Camera Kabushiki Kaisha. Laser recording apparatus. 4,799,069, Cl. 346-108.000.
Sasaoka, Michio: *See*—
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SASIB S.p.A.: *See*—
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Sasnett, Michael W.: *See*—
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Sato, Kazuhiko: *See*—
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Sato, Kimiteru; and Ito, Haruyuki, to Toto Ltd. Casting installation. 4,798,525, Cl. 425-84.000.
Sato, Masashi: *See*—
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Sato, Noboru: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,798,838, Cl. 514-342.000.
Satoh, Isao; Ichinose, Makoto; Fukushima, Yoshihisa; Kuroki, Yuzuru; and Takagi, Yuuji, to Matsushita Electric Industrial Co., Ltd. Optical recording and reproducing apparatus having erasing function with controlled erasing beam intensity. 4,799,208, Cl. 369-100.000.
Satoh, Yoshiki: *See*—
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Satomura, Hiroshi: *See*—
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Sauvan, Gerard, to Outillages Scientifiques et de Laboratoires O.S.L. Cleaning apparatus for electronic components and/or precision parts of machinery. 4,798,218, Cl. 134-74.000.
Sawada, Koji, to Nippon Engineer Service Kabushiki Kaisha. Underground tank with leak detection mechanism. 4,798,496, Cl. 405-53.000.
Sawata, Tetsuya: *See*—
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Scaglia, Enzo. Coupling element of the boom to the mast of a small sailing craft. 4,798,154, Cl. 114-98.000.
Scales, Hunter L., III; Moyer, William C.; and Wilson, William D., to Motorola, Inc. Bus master having burst transfer mode. 4,799,199, Cl. 365-230.000.
Schaberle, Erwin: *See*—
Elsasser, Martin; and Schaberle, Erwin, 4,798,064, Cl. 66-57.000.
Schafer, Werner: *See*—
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Schaffelhofer, Iwo: *See*—
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Schaffer, Ronald R.: *See*—
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Schaub, Bernhard; and Taylor, Steven, to Quaker Oats Company, The. Toy pop-up figure. 4,798,555, Cl. 446-310.000.
Scheiber, John G. Fluid Dispenser. 4,798,312, Cl. 222-180.000.
Schering Aktiengesellschaft: *See*—
Brinkmann, Bernd; and Lucas, Hermann-Josef, 4,798,878, Cl. 528-28.000.
Schering Corporation: *See*—
Saksena, Anil K.; Wong, Jesse K.; and Mangiaracina, Pietro, 4,798,842, Cl. 514-381.000.
Schippers, Heinz; and Gerhartz, Siegmar, to Barmag AG. Method for winding filament yarns. 4,798,347, Cl. 242-18.00R.
Schittenhelm, Rudolf: *See*—
Klingenbeck, Klaus; and Schittenhelm, Rudolf, 4,798,209, Cl. 128-653.000.
Schlueter, Kaspar: *See*—
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Schlumberger Technology Corporation: *See*—
Cheung, Philip S., 4,799,200, Cl. 367-30.000.
Kucuk, Fikri; and Ayestaran, Luis C., 4,799,157, Cl. 364-422.000.
Schmalfuss, Harald; Sinsel, Friedel; and Kurpiella, Hubertus, to Wilhelm Hegenscheidt Gesellschaft mbH. Method and apparatus for the contactless measuring of the tread quality of railroad. 4,798,964, Cl. 250-560.000.
Schmatz, Jurgen: *See*—
Benedikt, Walter; Heess, Gerhard; Herden, Werner; Friese, Karl-Hermann; Reum, Helmut; Schmatz, Jurgen; and Schwab, Siegbert, 4,798,991, Cl. 313-137.000.
Schmeck, Alfred, to Kraemer & Grebe GmbH & Co. KG Maschinenfabrik. Pneumatic drive for punching, cutting and stamping devices. 4,798,115, Cl. 83-639.000.
Schmidt, Lothar; and Schumbert, Hans-Joachim, to Leybold-Heraeus GmbH. System and method for regulating pressure in a container. 4,798,521, Cl. 417-295.000.
Schmidt, Steven P.: *See*—
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Schmidt, Terrence W., to Lockheed Missiles & Space Company, Inc. Stabilized hull swath vehicle. 4,798,153, Cl. 114-61.000.
Schmitt, Dieter; and Urban, Manfred, to Merck Patent Geselischaft Mit Beschrankter Haftung. Dampening agent for offset printing. 4,798,627, Cl. 106-2.000.
Schmitt, Herrmann: *See*—
Elter, Claus; Hornischer, Edgar; Schmitt, Herrmann; and Schoening, Josef, 4,798,700, Cl. 376-338.000.
Schmitt, Jacques, to Solems. Plasma-assisted method for thin film fabrication. 4,798,739, Cl. 427-38.000.
Schneider, Wilhelm; and Keller, Roland, to Deutsche Perrot-Bremse GmbH. Hydraulically actuated sliding-caliper disc brake. 4,798,270, Cl. 188-264.00G.
Schober, Helmo: *See*—
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Schoen, Roy C.: *See*—
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Schoening, Josef: *See*—
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Schonfelder, Lothar; and Franz, Gerhard, to Bayer Aktiengesellschaft. Process for the preparation of silicon nitride low in carbon content. 4,798,714, Cl. 423-344.000.
Schremmer, Gottfried: *See*—
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Schuetz, Jeffrey M., to Viskase Corporation. Heat shrinkable multilayer film for primal meat packaging. 4,798,751, Cl. 428-34.900.
Schulte, Guther: *See*—
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Schwab, Siegbert: *See*—
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Schwartz, Robert E.: *See*—
Pressnall, Dale W.; Keller, Michael R.; and Schwartz, Robert E., 4,798,150, Cl. 110-171.000.
Schweitzer, Leonard J. Rebar cutting and bending machine. 4,798,078, Cl. 72-389.000.
Schwitters, Wayne J., to WIC, Inc. Method of harvesting beets. 4,798,248, Cl. 171-1.000.
Sciaraffa, Michael A.: *See*—
Meyer, Stephen C.; Lance, Roger L.; Hetzler, Connie L.; Dunkerly, Cedric A., II; Roessler, Thomas H.; Zenker, David L.; and Sciaraffa, Michael A., 4,798,603, Cl. 604-378.000.
Scorzato, Giuseppe: *See*—
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Scott, Lucretia M. Camisole underwire bra garment. 4,798,557, Cl. 450-31.000.
Scott, Philip R.: *See*—
Thayer, Edward B.; Scott, Philip R.; and Roach, Thomas A., 4,798,328, Cl. 239-1.000.
Scott, Richard L.; Martin, John J.; and Smith, Landon, to Polysar Financial Services, S.A. Method of making a carpet. 4,798,644, Cl. 156-324.000.
Scott, Samuel C. Reinforced form liner for surface texturing of concrete structures. 4,798,364, Cl. 249-189.000.
Scoville, Eugene; Turek, Evan J.; Wragg, Anthony; Cuozzo, Karlina D.; and Rankowitz, Marshall M., to General Foods Corporation. Hydrolysis of a partially extracted roasted and ground coffee. 4,798,730, Cl. 426-432.000.
Sear, John, to Sevendart Limited, A Limited Company of U.K. Apparatus for use in sunbathing. 4,798,427, Cl. 350-1.100.
Seare, William J., Jr. Moldable retractor for use in surgery. 4,798,195, Cl. 128-20.000.
Secondo, Pierre: *See*—
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Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom, The: *See*—
McVeagh, John S., 4,798,145, Cl. 102-476.000.
Sedlacek, Douglas R., to Gates Rubber Company, The. Power transmission belt. 4,798,566, Cl. 474-238.000.
Seeburg, Peter H.: *See*—
Mason, Anthony J.; and Seeburg, Peter H., 4,798,885, Cl. 530-350.000.
Seidel, Gunther: *See*—
Mattis, Renate; Seidel, Gunther; Ubelhack, Heinrich; and Homer, Russel D., 4,799,256, Cl. 379-269.000.
Seiki, Takatoshi: *See*—
Akimoto, Taizo; Akisada, Masahide; Seiki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,799,072, Cl. 354-76.000.
Seikosha Co., Ltd.: *See*—
Kitaoka, Seiya; and Hanya, Masao, 4,799,204, Cl. 368-263.000.
Seiler, Erhard: *See*—
Lausberg, Dietrich; Blinne, Gerd; Ittemann, Peter; Heinz, Gerhard; Seiler, Erhard; and Knoll, Manfred, 4,798,855, Cl. 523-435.000.
Seki, Seizo: *See*—
Kishi, Masahichi; Seki, Seizo; and Kanmuri, Noboru, 4,799,257, Cl. 380-9.000.
Seki, Shigemi: *See*—
Itoyama, Kuniyoshi; Horita, Norihiro; Seki, Shigemi; and Minami, Satoyuki, 4,798,875, Cl. 525-444.000.
Sekiguchi, Yoshinobu: *See*—
Miyazawa, Seiichi; Hara, Toshitami; Nojiri, Hidetoshi; Sekiguchi, Yoshinobu; Hasegawa, Mitsutoshi; and Ikeda, Sotomitsu, 4,799,229, Cl. 372-30.000.
Sekitani, Noboru: *See*—
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Sela, Richard: *See—*
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Selectro-Vision, Ltd.: *See—*
Richardson, John, 4,798,387, Cl. 273-237.000.
Selker, Hermann G.: *See—*
Leifeld, Ferdinand; and Selker, Hermann G., 4,797,976, Cl. 19-200.000.
Senderowicz, Daniel: *See—*
Confalonieri, Pierangelo; Senderowicz, Daniel; and Nicollini, Germano, 4,799,042, Cl. 341-118.000.
Sepponen, Raimo, to Instrumentarium Corp. Method of mapping the nuclear magnetic properties of an object to be examined. 4,799,015, Cl. 324-314.000.
Sestrap, Arvo M. Nozzle assembly for hot air torch. 4,798,530, Cl. 431-354.000.
Seto, Toshiaki; and Morinaga, Masaru, to Nippon Seiko Kabushiki Kaisha. Seat belt buckle. 4,797,984, Cl. 24-641.000.
Seton Health Care Foundation: *See—*
Muckerheide, Myron C., 4,799,103, Cl. 358-88.000.
Sevendart Limited, A Limited Company of U.K.: *See—*
Sear, John, 4,798,427, Cl. 350-1.100.
SGS Microelettronica S.p.A: *See—*
Confalonieri, Pierangelo; Senderowicz, Daniel; and Nicollini, Germano, 4,799,042, Cl. 341-118.000.
SGS Microelettronica S.p.A.: *See—*
Cozzi, Lucio, 4,799,021, Cl. 324-73.00R.
Shaffer, Don T.; and Milyard, Emmert. Cycle apparatus having therapeutic and utility aspects. 4,798,395, Cl. 280-240.000.
Shah, Arun: *See—*
Wilson, J. Chris; and Shah, Arun, 4,799,155, Cl. 364-200.000.
Sharon Manufacturing Company: *See—*
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Sharp Kabushiki Kaisha: *See—*
Kaminaka, Ikuyasu, 4,798,927, Cl. 219-10.55B.
Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,799,227, Cl. 372-46.000.
Takeda, Makoto; Yamamoto, Kunihiko; Matsuhashi, Nobuaki; and Take, Hiroshi, 4,799,057, Cl. 340-811.000.
Taneya, Mototaka; Matsui, Sadayoshi; and Matsumoto, Mitsuhiro, 4,799,225, Cl. 372-44.000.
Sharp, Kenneth G.: *See—*
D'Errico, John J.; and Sharp, Kenneth G., 4,798,713, Cl. 423-342.000.
Shavit, Eyal; and Teichner, Lester, to Strategic Processing Corporation. Interactive market management system. 4,799,156, Cl. 364-401.000.
Shell Internationale Research Maatschappij, B.V.: *See—*
Pettman, Roger B.; and Wells, Nicholas S., 4,798,845, Cl. 514-400.000.
Shell Oil Company: *See—*
Bannell, John L. K.; Dixon, Arnold G.; and Davies, Trevor P., 4,799,235, Cl. 374-18.000.
Brons, Henricus M. J.; and Geuze, Maarten M., 4,798,884, Cl. 528-491.000.
Handlin, Dale L., Jr., 4,798,853, Cl. 523-173.000.
Langner, Carl G., 4,798,158, Cl. 114-253.000.
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Sheperd, Thomas M.: *See—*
Cunha, Daniel; Brown, Wayne M.; Pool, James E.; and Sheperd, Thomas M., 4,798,141, Cl. 102-293.000.
Sherwood Medical Company: *See—*
Okada, Yosuke, 4,798,591, Cl. 604-164.000.
Ranford, Alan B., 4,798,578, Cl. 604-4.000.
Shiba, Haruo: *See—*
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Shibata, Hiroshi: *See—*
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Shikoku Chemicals Corporation: *See—*
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Shikoku Kakoki Co., Ltd.: *See—*
Shimokawa, Masao, 4,798,337, Cl. 239-570.000.
Shimada, Katsuhiko: *See—*
Yamamoto, Takashi; Shimada, Katsuhiko; Murata, Ryuji; Tahara, Yasuteru; Terada, Hiromu; and Sakunaga, Kenichi, 4,798,445, Cl. 350-96.340.
Shimada, Naohiro: *See—*
Nagasaka, Hiroko; Hatakoshi, Gen-ichi; Shimada, Naohiro; Yamamoto, Motoyuki; Okajima, Masaki; Iizuka, Yoshio; Kawata, Hatsumi; Kinoshita, Hideaki; and Matsuura, Nobuyuki, 4,799,228, Cl. 372-46.000.
Shimizu, Isamu: *See—*
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Hirooka, Masaaki; Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, 4,798,809, Cl. 437-4.000.
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Shimokawa, Masao, to Shikoku Kakoki Co., Ltd. Liquid filling nozzle. 4,798,337, Cl. 239-570.000.
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Yamaguchi, Shuichiro; Ushizawa, Norihiko; and Shimomura, Takeshi, 4,798,664, Cl. 204-418.000.
Shimura, Shinya: *See—*
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Shinada, Shinichi: *See—*
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Shinkawa, Kiyoshi; Kawahara, Takeshi; Hayakawa, Hideki; and Mori, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Route bus service controlling system. 4,799,162, Cl. 364-436.000.
Shinohara, Hideo: *See—*
Shiono, Katsumi; Shinohara, Hideo; Naito, Sadao; and Ikeda, Goroo, 4,799,166, Cl. 364-497.000.
Shiono, Katsumi; Shinohara, Hideo; Naito, Sadao; and Ikeda, Goroo, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for automatically analyzing gases in oil. 4,799,166, Cl. 364-497.000.
Shiota, Keiichi, to Kabushiki Kaisha Toshiba. Ink ribbon control apparatus for locating replacement cartridge color band in a color printer. 4,798,489, Cl. 400-216.100.
Shirahama, Toshio: *See—*
Ichigaya, Hiroshi; Tagawa, Susumu; Sugii, Yasuoshi; Ando, Masanori; Yamazaki, Jun; Kawada, Yasuo; Kinoshita, Tokuho; Shirahama, Toshio; Ito, Yoshinori; and Munemoto, Eiji, 4,798,992, Cl. 313-406.000.
Shiratori, Harunori: *See—*
Nakamura, Keiichi; Tanaka, Tsuneo; Inaguma, Yoshiharu; and Shiratori, Harunori, 4,798,050, Cl. 60-329.000.
Shiratori, Tatsuya: *See—*
Koike, Michiro; Ozawa, Takashi; Yamamoto, Yasuyoshi; Ohashi, Masashi; Kimura, Akiyoshi; Sasaki, Nobukazu; Kasamura, Toshirou; Kubota, Atsushi; Shiratori, Tatsuya; and Kusumoto, Toshihiko, 4,799,084, Cl. 355-14.0SH.
Shirley, Ian M.: *See—*
Ballard, Denis G. H.; Holmes, Paul A.; Nevin, Alan; Shirley, Ian M.; and Twose, David L., 4,798,742, Cl. 427-240.000.
Shiroi, Takashi: *See—*
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; and Shiroi, Takashi, 4,798,890, Cl. 540-358.000.
Shirose, Toshihiro; and Sakurai, Akira, to Kao Corporation. Sanitary napkin. 4,798,601, Cl. 604-368.000.
Showell, Michael S.: *See—*
Castro, Artemio; and Showell, Michael S., 4,798,679, Cl. 252-174.150.
Showscan Film Corporation: *See—*
Trumbull, Douglas; Collins, David; Smith, Wayne; and Spieldiener, Robert, 4,798,376, Cl. 272-18.000.
Shriner, Donald R.: *See—*
Dayton, Douglas C.; Bergeron, Richard; and Shriner, Donald R., 4,799,254, Cl. 379-97.000.
SI Handling Systems, Inc.: *See—*
Pyle, Roger A.; and Lindovist, Per E., 4,798,147, Cl. 104-166.000.
Siebold, Horst; and Strahwald, Franz, to Siemens Aktiengesellschaft. Background field magnet for image generating devices using nuclear spin resonance. 4,799,017, Cl. 324-319.000.
Siemens AG: *See—*
Johnson, Alfred H.; Pohl, Peter; Prauer, Heinz; and Schulz, Dietmar, 4,798,430, Cl. 350-96.200.
Siemens Aktiengesellschaft: *See—*
Fischer, Helmut, 4,799,024, Cl. 328-110.000.
Grassl, Hans P., 4,799,184, Cl. 364-821.000.
Haeussler, Klaus M.; Wittmann, Julius; Gaukel, Gisela; and Auracher, Franz, 4,799,234, Cl. 372-97.000.
Klingenbeck, Klaus; and Schittenhelm, Rudolf, 4,798,209, Cl. 128-653.000.
Koeppe, Siegmar, 4,799,096, Cl. 357-42.000.
Mattis, Renate; Seidel, Gunther; Ubelhack, Heinrich; and Homer, Russel D., 4,799,256, Cl. 379-269.000.
Reczek, Werner; and Winneri, Josef, 4,798,974, Cl. 307-296.00R.
Siebold, Horst; and Strahwald, Franz, 4,799,017, Cl. 324-319.000.
Welsch, Wolfgang, 4,799,232, Cl. 372-61.000.
Wolf, Gerhard, 4,799,149, Cl. 364-200.000.
Sigler, Gerald F., to Hoechst Celanese Corporation. Biotinylating agents. 4,798,795, Cl. 435-177.000.
Sigma Research, Inc.: *See—*
Franklin, James L., 4,798,056, Cl. 62-235.100.
Siliconix Incorporated: *See—*
Blanchard, Richard A.; and Cogan, Adrian, 4,798,810, Cl. 437-29.000.
Blanchard, Richard A.; and Cogan, Adrian I., 4,799,100, Cl. 357-52.000.
Silver, Marc L.; and Pizzolato, John. Document shredding machine. 4,798,116, Cl. 83-858.000.
Silver, Ronald: *See—*
Bernstein, Howard L.; Grill, Thomas M.; and Silver, Ronald, 4,798,322, Cl. 235-487.000.
Silverman, Lawrence H.; Teague, Randy; and Kaminsky, Richard, to General Instrument Corporation. Varactor tunable coupled transmission line band reject filter. 4,799,034, Cl. 333-202.000.
Simons, Frank H.; and Ferguson, Benjamin A., to Celanese Fibers, Inc. Dynamic test system for sewing threads. 4,798,152, Cl. 112-262.100.
Sinderhauf, Joachim: *See—*
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Singer, Robert: *See—*
Jongenburger, Peter; and Singer, Robert, 4,798,625, Cl. 75-235.000.

Single Buoy Moorings, Inc.: *See*—
Poldervaart, Leendert, 4,798,155, Cl. 114-230.000.
Sinsel, Friedel: *See*—
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Site Microsurgical Systems, Inc.: *See*—
DeMeo, Deborah A.; Bross, Robert M.; and Cook, Kenneth P., 4,798,580, Cl. 604-30.000.
Siversson, Per-Erik, to Flodins Filter AB. Method and apparatus for the manufacture of filters. 4,798,575, Cl. 493-346.000.
Skalsky, Michael: *See*—
Maddison, David S.; Skalsky, Michael; Milijasevic, Zoran; Perry, Stephen G.; Holley, Loraine K.; Gotthardt, Gerhard R.; and Richardson, Garry T., 4,798,206, Cl. 128-419.00P.
SKF GmbH: *See*—
Kruk, Stanislaw, 4,798,482, Cl. 384-571.000.
SKF Industrial Trading and Development Co. B.V.: *See*—
Bayer, Antonius L.; Bles, Bernhardus A. L.; Hands, Godfrey; and Hovden, Dag A., 4,798,299, Cl. 212-157.000.
Skierszkan, Simon J., to Mitel Corporation. Frequency doubler with duty cycle monitor means. 4,799,022, Cl. 328-20.000.
Skillpack B.V.: *See*—
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Skotch, Inc.: *See*—
Mitchell, Richard A.; and Buchanan, Joseph R., 4,798,223, Cl. 137-312.000.
Slater Electric, Inc.: *See*—
Bowden, Wade R., Jr. ; and Rushansky, Yuliy, 4,797,988, Cl. 29-566.400.
Sloan-Kettering Institute: *See*—
Thomson, Timothy M.; Mattes, M. Jules; Old, Lloyd J.; and Lloyd, Kenneth O., 4,798,790, Cl. 435-7.000.
Slyh, Robert E., Jr.: *See*—
Leemkuil, Hendrik; and Slyh, Robert E., Jr., 4,798,275, Cl. 198-372.000.
Smetana, Klaus: *See*—
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Smith, Berry E., Jr. Electric generator having stationary induction coils. 4,798,986, Cl. 310-268.000.
Smith, Bryce M.: *See*—
Weaver, Gary R.; Smith, Bryce M.; Horvath, Gregory L.; and Walsh, Bernard L., Jr., 4,799,028, Cl. 331-57.000.
Smith, Donald E.; and Sasnett, Michael W., to Coherent General. Laser gas orifice injection system. 4,799,231, Cl. 372-58.000.
Smith, Jesse E., Jr. Fish fillet retainer device. 4,797,974, Cl. 17-45.000.
Smith, Landon: *See*—
Scott, Richard L.; Martin, John J.; and Smith, Landon, 4,798,644, Cl. 156-324.000.
Smith and Nephew Associated Companies p.l.c.: *See*—
Carter, Andrew J., 4,798,604, Cl. 604-383.000.
Rawlings, David A.; and Potter, William D., 4,798,201, Cl. 128-156.000.
Smith, Richard B.; and Tolson, Michael T., to Bell South Corporation. ESS equipment testing device. 4,799,251, Cl. 379-1.000.
Smith, Thomas R. Shaft coupling and method for using same. 4,798,492, Cl. 403-223.000.
Smith, Wayne: *See*—
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SmithKline Beckman Corporation: *See*—
Kruse, Lawrence I., 4,798,843, Cl. 514-392.000.
Smolders, Cornelis A.: *See*—
Roesink, Hendrik D. W.; Smolders, Cornelis A.; Mulder, Marcellinus H. V.; and Koenhen, Dirk M., 4,798,847, Cl. 521-50.000.
Smoljo, Dragomir. Thermo blanket. 4,798,220, Cl. 135-115.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Feldmann, Hugo; Hollmann, Friedrich; Gartner, Horst; and Beisemann, Gerd, 4,798,074, Cl. 72-247.000.
Smulders, Henricus J.: *See*—
Jansen, Gerardus L. M.; and Smulders, Henricus J., 4,798,447, Cl. 350-255.000.
Snyder, Douglas D.: *See*—
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Societe a Responsabilite Limitee: Erca Holding: *See*—
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Societe Francaise d'Equipments pour la Navigation Aerienne & Societe Automates et Automatismes: *See*—
Vichon, Didier; Bardon, Dominique; and Encrenaz, Christian, 4,798,449, Cl. 350-358.000.
Societe Industrielle de Combustible Nucleaire: *See*—
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Societe Orega Electronique Et Mecanique: *See*—
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Sodini, Charles G.: *See*—
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Sodler, Walter: *See*—
Knothe, Erich; Melcher, Franz-Josef; Maaz, Gunther; Dardat, Klaus; and Sodler, Walter, 4,798,250, Cl. 177-181.000.
Soejima, Shigeo: *See*—
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Sogawa, Yoshiyuki, to Fuji Jukogyo Kabushiki Kaisha. System for measuring intake airflow rate in an engine. 4,798,083, Cl. 73-118.200.
Solems: *See*—
Schmitt, Jacques, 4,798,739, Cl. 427-38.000.
Solow, Joseph E., to Wolo Manufacturing Corporation. Automobile ignition lock cover with chain and bracket mounting. 4,798,066, Cl. 70-212.000.
Solvay & Cie (Societe Anonyme): *See*—
Legrand, Franz; and De Bruycker, Patricia, 4,798,710, Cl. 423-69.000.
Ninane, Leon; and Breton, Claude, 4,797,981, Cl. 23-303.000.
Soma, Takao: *See*—
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Somar Corporation: *See*—
Sumi, Shigeo, 4,798,646, Cl. 156-364.000.
Someya, Ryoichi: *See*—
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Someya, Shinzo; Akahira, Rokuro; Horino, Hiroshi; Ohnaka, Michihiro; and Kiuchi, Takashi, to Agro-Kanesho Co., Ltd. Novel chloroacetanilide derivatives and herbicides containing the same for use in paddy field. 4,798,618, Cl. 71-92.000.
Sony Corporation: *See*—
Aoki, Tokuei; Kudo, Junichiro; and Kohno, Katsumi, 4,798,767, Cl. 428-412.000.
Fukami, Tadashi; Ozaki, Shinya; and Odaka, Kentaro, 4,799,221, Cl. 371-38.000.
Ichigaya, Hiroshi; Tagawa, Susumu; Sugii, Yasuoshi; Ando, Masanori; Yamazaki, Jun; Kawada, Yasuo; Kinoshita, Tokuho; Shirahama, Toshio; Ito, Yoshinori; and Munemoto, Eiji, 4,798,992, Cl. 313-406.000.
Ida, Mitsuru; and Koga, Noriyuki, 4,799,116, Cl. 360-74.100.
Ito, Yuji, 4,799,111, Cl. 360-14.300.
Murakami, Yoshihiro, 4,799,113, Cl. 360-32.000.
Ohyama, Masao, 4,799,117, Cl. 360-96.500.
Takahashi, Kenji, 4,799,121, Cl. 360-133.000.
Soullard, Marcel; and Brochard, Victor, to Boca-Quest. Process and plant for the treatment of meat of cattle or other quadrupeds. 4,797,975, Cl. 17-46.000.
Southard, James H.: *See*—
Belzer, Folkert O.; and Southard, James H., 4,798,824, Cl. 514-60.000.
Southwest Research Institute: *See*—
Lyle, Robert E., Jr.; and Hamil, Henry F., 4,798,870, Cl. 525-327.100.
Spadafora, Peter J.; Hersberger, Jill G.; Bell, Myron H.; and Harding, Robert L., to Delco Electronics Corporation. Method and apparatus for detecting rotational speed. 4,799,178, Cl. 364-565.000.
Spalding & Evenflo Companies, Inc.: *See*—
Janes, Richard, 4,798,382, Cl. 273-73.00C.
Spector, George: *See*—
Pearson, Victor I.; and Spector, George, 4,798,366, Cl. 254-22.000.
Thomas, Barry G.; and Spector, George, 4,798,707, Cl. 422-264.000.
Spectra-Physics, Inc.: *See*—
Cherry, Craig D., 4,798,943, Cl. 235-463.000.
Hellekson, Ronald A.; Acosta, Jorge L.; and Campbell, John S., 4,799,164, Cl. 235-467.000.
Spectra Star Kites: *See*—
Alonso, Frank, 4,798,356, Cl. 244-153.00R.
Speed Queen Company: *See*—
Coates, Donald A.; Manthei, Philip J.; and Allen, Max D., 4,798,424, Cl. 312-257.00R.
Sperduti, Bernard D.; and Cerankowski, James A., to HiTech Robotics Ltd. Zoning conveyor. 4,798,282, Cl. 198-781.000.
Sperry Marine Inc.: *See*—
Wesner, Charles R., 4,799,163, Cl. 364-457.000.
Spiece, Rickey J., to Bell & Howell Company. Interactive training method and system. 4,798,543, Cl. 434-323.000.
Spieldiener, Robert: *See*—
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Spies, Klaus, to Rudolf Hausherr & Sohne GmbH & Co. KG. Flexible rock anchor. 4,798,501, Cl. 405-260.000.
Spinelli, Silvano: *See*—
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Spinner GmbH, Elektrotechnische Fabrik: *See*—
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Springer, William E.: *See*—
Taylor, David C.; Springer, William E.; Goeller, Loretta; and Santhouse, Daniel, 4,799,124, Cl. 361-42.000.
Sprinkle, Charles R. Versatile tractor side blade mount. 4,798,011, Cl. 37-108.00R.
Srock, Rainer: *See*—
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SRX Corporation: *See*—
Johnson, Charles B.; Box, Jeffrey L.; and Hildebrand, David B., 4,799,216, Cl. 370-67.000.
SSI Medical Services, Inc.: *See*—
Goodwin, Vernon L., 4,798,227, Cl. 137-554.000.
Staar, S.A.: *See*—
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Staas, Ernst: *See*—
Grossmann, Horst; and Staas, Ernst, 4,798,001, Cl. 30-355.000.
Staal, Karlhans; and Moltner, Hermann, to Kocks Technik GmbH & Co. Seamless tube production. 4,798,071, Cl. 72-97.000.

Stabilad Limited: *See*—
Harvey, David H. C.; and Menelaus, Ian G., 4,798,263, Cl. 182-107.000.

Stadler, Eberhard: *See*—
Maaz, Gunther; Bierich, Eduard; and Stadler, Eberhard, 4,798,251, Cl. 177-229.000.

Staheli, Paul; and Knabenhans, Fritz, to Maschinenfabrik Rieter AG. Arrangement for supplying a fiber processing machine. 4,797,979, Cl. 19-105.000.

Stahly, G. Patrick, to Ethyl Corporation. Producing bis(alicyclic) thioethers. 4,798,900, Cl. 548-461.000.

Stake Technology Ltd.: *See*—
Kokta, Bohuslav, 4,798,651, Cl. 162-22.000.

Standard Telephones & Cables: *See*—
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Stanger, Leon J.: *See*—
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Stanker, Larry H.: *See*—
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Stankewitz, Hans-Werner: *See*—
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Starcke, Steven F.: *See*—
Rossi, Renato V.; Starcke, Steven F.; and Swagel, David A., 4,799,119, Cl. 360-123.000.

Starkweather, John H.: *See*—
Hsia, Edward S.; Starkweather, John H.; and Koffel, William K., 4,798,515, Cl. 415-115.000.

Starrfrasmaschinen AG: *See*—
Ameseder, Anton, 4,798,505, Cl. 409-136.000.

Staub, Vincent M., Jr., to General Motors Corporation. Cam and lock vacuum booster mount with inverse arc securing tab arm. 4,798,129, Cl. 92-128.000.

Stauffer, Jorg; and Riethmann, Hans, Jr. Opening cylinder for open-end spinning machines. 4,798,046, Cl. 57-408.000.

Steenhuisen, Johannes E.: *See*—
Mijers, Jan W. M.; and Steenhuisen, Johannes E., 4,798,671, Cl. 210-238.000.

Steenken, Bernhard: *See*—
Gattermann, Bernd; Steenken, Bernhard; Grosse-Scharmann, Franz; and Muller, Horst, 4,798,271, Cl. 192-18.00R.

Steffensen, Jorn: *See*—
Worth, John N.; and Steffensen, Jorn, 4,798,314, Cl. 222-542.000.

Steimle, Josef: *See*—
Feilhauer, Helmut; and Steimle, Josef, 4,798,442, Cl. 350-96.210.

Stein Associates, Inc.: *See*—
Booth, Raymond E.; and Miller, Michael E., 4,798,283, Cl. 198-860.500.

Steiner, Rolaud; and Van Meir, Eugene, to Nestec S.A. Device for connecting and draining a pouch. 4,798,605, Cl. 604-411.000.

Stembridge, W. Frank: *See*—
Stembridge, William F.; Stembridge, W. Frank; and Sturrock, James C., 4,798,232, Cl. 141-1.000.

Stembridge, William F.; Stembridge, W. Frank; and Sturrock, James C., to Coca-Cola Company, The. Automatic control system for filling beverage containers. 4,798,232, Cl. 141-1.000.

STEMCOR Corporation: *See*—
Tressler, Richard T.; and Boeglin, Herman J., 4,798,764, Cl. 428-312.600.

Sten, Urpo: *See*—
Kahkipuro, Matti; Sten, Urpo; Nummi, Pekka; and Hytti, Pekka, 4,799,139, Cl. 363-95.000.

Stern, Morton; and Williams, James, to Motorola, Inc. Colocated cellular radiotelephone systems. 4,799,253, Cl. 379-59.000.

Steuer, Werner: *See*—
Keller, Josef; and Steuer, Werner, 4,798,098, Cl. 74-470.000.

Stevens, Robert C., to Cordis Corporation. Method and apparatus for aiding dilatation catheterization. 4,798,586, Cl. 604-96.000.

Stevenson, William A., to Foster-Miller, Inc. Monitoring technology. 4,798,954, Cl. 250-341.000.

Stewart, Nevin J.: *See*—
Hodgson, Philip K. G.; and Stewart, Nevin J., 4,798,906, Cl. 568-614.000.

Stich, Richard A.: *See*—
Armstrong, William J.; and Stich, Richard A., 4,798,425, Cl. 312-328.000.

Stoerzinger, Charles A.; and Machlett, James, to Tombstone Pizza Corporation. Point-of-purchase display. 4,798,014, Cl. 40-124.100.

Stolle Research and Development Corporation: *See*—
Tice, Thomas R.; and Meyers, William E., 4,798,786, Cl. 435-177.000.

Stone, Dennis C.: *See*—
Bremmer, Robert A.; Kovner, Vladimir; and Stone, Dennis C., 4,799,112, Cl. 360-31.000.

Stone, Forrest D.; and Trondsen, John M., to Trondsen, John M. Programmable dispensing apparatus for pills or the like. 4,798,309, Cl. 221-4.000.

Stoneburner, Larry P.: *See*—
Pollock, Paul R.; and Stoneburner, Larry P., 4,798,394, Cl. 280-96.100.

Stork Perforated Products B.V.: *See*—
Morssinkhof, Gerhardus H.; Vogel, Lubbertus; and Leenheer, Adrianus, 4,798,023, Cl. 47-26.000.

Stoughton, John W.; and Neal, Charles B., to RCA Licensing Corporation. Auxiliary gain control apparatus for a television receiver. 4,799,107, Cl. 358-169.000.

Stout Industries, Inc.: *See*—
George, Gary P., 4,798,031, Cl. 52-309.110.

Stout, Roger P.: *See*—
Michaud, Gerard H.; Graham, James H.; and Stout, Roger P., 4,797,994, Cl. 29-720.000.

Strahwald, Franz: *See*—
Siebold, Horst; and Strahwald, Franz, 4,799,017, Cl. 324-319.000.

Strandberg, Anders, to Boxholmkonsult AB. Device for providing lime to acidulated waters. 4,798,475, Cl. 366-160.000.

Strategic Processing Corporation: *See*—
Shavit, Eyal; and Teichner, Lester, 4,799,156, Cl. 364-401.000.

Strecker, Ruediger, to Bayern-Chemie Gesellschaft fuer flung-chemische Antriebe mbH. Composite solid propellant. 4,798,636, Cl. 149-19.900.

Streifer, William; Burnham, Robert D.; and Paoli, Thomas L., to Xerox Corporation. Split contact phased array lasers. 4,799,223, Cl. 372-24.000.

Streng, Johannes H., to U.S. Philips Corporation. Electrostatic transducer unit. 4,799,265, Cl. 381-116.000.

Streu, Joachim: *See*—
Werner, Frank; Streu, Joachim; and Mueller, Herbert, 4,798,851, Cl. 521-137.000.

Strohschneider, Heinz F., deceased (B., Strohschneider; Waltraud, legal representative), to Augat Inc. ATE test fixture having a self-sealing vacuum skirt. 4,799,006, Cl. 324-158.00F.

Struth, Helmut, to Boehringer Ingelheim KG. Charging valve. 4,798,226, Cl. 137-512.400.

Strzalko, Peter; Walber, Franz-Josef; and Wombacher, Ulrich, to Henkel Kommanditgesellschaft auf Aktien. Illuminated point-of-sale shelf unit insert. 4,799,133, Cl. 362-133.000.

Studiengesellschaft Kohle, GmbH: *See*—
Bogdanovic, Borislav, 4,798,718, Cl. 423-647.000.

Sturm, Harald; Terwonne, Rolf-Walter; and Thunig, Dieter, to Huels Aktiengesellschaft. Process for the production of thermoplastic compositions and compositions produced thereby. 4,798,869, Cl. 525-305.000.

Sturrock, James C.: *See*—
Stembridge, William F.; Stembridge, W. Frank; and Sturrock, James C., 4,798,232, Cl. 141-1.000.

Styfhoorn, John, to Caterpillar Inc. Test bench for testing hydraulic pumps and motors. 4,798,086, Cl. 73-168.000.

Styner & Bienz AG: *See*—
Glaus, Heinrich; Lehmann, Peter; Joehr, Hans; and Freiburghaus, Rene , 4,798,231, Cl. 140-119.000.

Subhash, Gandbhir: *See*—
Erwin, Piepka; Paul, Wollhaf; and Subhash, Gandbhir, 4,798,504, Cl. 409-2.000.

Suenaga, Yutaka: *See*—
Matsumoto, Koichi; Suenaga, Yutaka; Uehara, Makoto; and Muramatsu, Kiyoyuki, 4,798,962, Cl. 250-548.000.

Suga, Nagaichi, to Suga Test Instruments Co., Ltd. Artificial snow production apparatus. 4,798,331, Cl. 239-14.200.

Suga Test Instruments Co., Ltd.: *See*—
Suga, Nagaichi, 4,798,331, Cl. 239-14.200.

Sugata, Hiroyuki; Nakata, Kouhei; Mizusawa, Nobutoshi; Yuasa, Satoshi; Haruta, Masahiro; Hamamoto, Takashi; and Osabe, Kuniji, to Canon Kabushiki Kaisha. Method for producing composite materials. 4,798,694, Cl. 264-60.000.

Sugawara, Hideo, to Fujitsu Limited. Directional coupler. 4,799,032, Cl. 333-116.000.

Sugibuchi, Kazuo: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Hirai, Bunji; and Sugibuchi, Kazuo, 4,798,836, Cl. 524-89.000.

Sugii, Yasuoshi: *See*—
Ichigaya, Hiroshi; Tagawa, Susumu; Sugii, Yasuoshi; Ando, Masanori; Yamazaki, Jun; Kawada, Yasuo; Kinoshita, Tokuho; Shirahama, Toshio; Ito, Yoshinori; and Munemoto, Eiji, 4,798,992, Cl. 313-406.000.

Sugimoto, Yasuhiro: *See*—
Sugiyama, Hisashi; Sugimoto, Yasuhiro; and Kamatani, Yukio, 4,798,980, Cl. 307-471.000.
Tsugaru, Kazunori; and Sugimoto, Yasuhiro, 4,798,981, Cl. 307-475.000.

Sugino, Hiroshi: *See*—
Sugino, Kenji; Yanaida, Katsuya; Sugino, Hiroshi; Nakaya, Masao; Nishida, Nobuo; and Eda, Kensaku, 4,798,339, Cl. 239-601.000.

Sugino, Kenji; Yanaida, Katsuya; Sugino, Hiroshi; Nakaya, Masao; Nishida, Nobuo; and Eda, Kensaku, to Sugino Machine Limited. Submerged jet injection nozzle. 4,798,339, Cl. 239-601.000.

Sugino Machine Limited: *See*—
Sugino, Kenji; Yanaida, Katsuya; Sugino, Hiroshi; Nakaya, Masao; Nishida, Nobuo; and Eda, Kensaku, 4,798,339, Cl. 239-601.000.

Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, to House Food Industrial Company Limited. Method of retort packaging broiled fish and product thereof. 4,798,728, Cl. 426-129.000.

Sugiyama, Hisashi; Sugimoto, Yasuhiro; and Kamatani, Yukio, to Kabushiki Kaisha Toshiba. Booth's conversion circuit. 4,798,980, Cl. 307-471.000.

Sugiyama, Yasunori, to Asics Corporation. Midsole for sports shoes. 4,798,010, Cl. 36-30.00R.

Sulzer Brothers Limited: *See*—
Geisseler, Max, 4,798,930, Cl. 219-76.120.

Sulzer Morat GmbH: *See*—
Elsasser, Martin; and Schaberle, Erwin, 4,798,064, Cl. 66-57.000.
Sumi, Shigeo, to Somar Corporation. Film peeling apparatus having film end detector. 4,798,646, Cl. 156-364.000.
Sumitomo Metal Mining Company Limited: *See*—
Kimura, Takayoshi; Ojima, Yasuo; and Mori, Yoshiaki, 4,798,532, Cl. 432-210.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Fujiwara, Kenichi, 4,798,236, Cl. 152-209.00R.
Suntory Limited: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,798,131, Cl. 99-277.200.
Sury, Patty A.; and Wilkins, James E. Portable blind. 4,798,019, Cl. 43-1.000.
Suzuki, Akiyoshi, to Canon Kabushiki Kaisha. Imaging optical system. 4,798,450, Cl. 350-505.000.
Suzuki, Hideyuki: *See*—
Hattori, Katsuhiko; Suzuki, Hideyuki; and Ogasawara, Takeo, 4,798,561, Cl. 474-28.000.
Suzuki, Hiroshi, to NEC Corporation. High-speed packet-switched communications system with end-to-end flow control and retransmission. 4,799,215, Cl. 370-60.000.
Suzuki, Keiichiro. Electrostatic reproducing apparatus. 4,799,082, Cl. 355-14.00R.
Suzuki, Kenkichi: *See*—
Okamoto, Yukio; Shinada, Shinichi; Suzuki, Kenkichi; and Kougami, Akihiko, 4,799,058, Cl. 340-811.000.
Suzuki, Masayuki: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,799,074, Cl. 354-173.100.
Suzuki, Mikio, to Mitutoyo Corporation. Displacement detecting apparatus. 4,798,004, Cl. 33-172.00E.
Suzuki, Mitsuo, to Kabushiki Kaisha Toshiba. Adaptive automatic equalizer. 4,799,180, Cl. 364-724.200.
Suzuki, Satoshi; and Someya, Ryoichi, to Mabuchi Motor Co., Ltd. Electric motor with earth plate press fitted to motor casing. 4,798,984, Cl. 310-68.00C.
Suzuki, Shoichi: *See*—
Tachi, Kazuyuki; Okuda, Chikaaki; Yamada, Katsunori; Oyama, Yoichi; and Suzuki, Shoichi, 4,798,335, Cl. 239-296.000.
Suzuki, Shuji: *See*—
Fujiwara, Masahiko; Ajisawa, Akira; and Suzuki, Shuji, 4,798,435, Cl. 350-96.130.
Suzuki, Susumu: *See*—
Okamoto, Hiroshi; Fushimi, Kimio; and Suzuki, Susumu, 4,798,057, Cl. 62-228.300.
Suzuki, Tadashi: *See*—
Sakagami, Atsushi; Futami, Toru; Abe, Noriyuki; and Suzuki, Tadashi, 4,799,218, Cl. 370-85.000.
Suzuki, Toshio: *See*—
Yahagi, Kazuyuki; and Suzuki, Toshio, 4,798,721, Cl. 424-70.000.
Svanstrom, Rune, to Aktiebolaget Bofors. Magazines. 4,798,123, Cl. 89-34.000.
Swagel, David A.: *See*—
Rossi, Renato V.; Starcke, Steven F.; and Swagel, David A., 4,799,119, Cl. 360-123.000.
Swan, Jack C., Jr.: *See*—
Heath, Gary B.; Palsulich, William G.; Manica, Keith J.; and Swan, Jack C., Jr., 4,798,090, Cl. 73-715.000.
Swindell, Archie C.: *See*—
Krupp, Michael N.; and Swindell, Archie C., 4,798,835, Cl. 514-369.000.
Swiss Aluminium Ltd.: *See*—
Paulet, Jean-Francois, 4,798,656, Cl. 204-37.600.
Sylvester, Gerd: *See*—
Meurer, Kurt P.; Waniczek, Helmut; Sylvester, Gerd; and Witte, Josef, 4,798,873, Cl. 525-333.700.
Symbolics Inc.: *See*—
Nestler, Eric; and Knight, Thomas F., 4,799,055, Cl. 340-710.000.
Symes, Kenneth C.; and Fleaher, Peter, to Allied Colloids Ltd. Dry polymers. 4,798,888, Cl. 536-123.000.
Syntex (U.S.A.) Inc.: *See*—
Khanna, Pyare; and Pearlman, Fred, 4,798,804, Cl. 436-94.000.
Sziuk, Nicholas J.; and Fukumoto, Jay T., to NCR Corporation. CMOS integrated devices in seeded islands. 4,799,097, Cl. 357-42.000.
Tabei, Shigeru, to Tobu Electric Co., Ltd. Snap-action heat responsive device. 4,799,038, Cl. 337-379.000.
Tachi, Kazuyuki; Okuda, Chikaaki; Yamada, Katsunori; Oyama, Yoichi; and Suzuki, Shoichi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Rotating spraying type coating apparatus. 4,798,335, Cl. 239-296.000.
Tachi, Yoshiya; and Hotta, Noriyuki, to Hotta Co., Ltd. (Hotta Kabushiki Kaisha). Collar for a pet. 4,798,174, Cl. 119-106.000.
Tackles, George: *See*—
Bullock, Joseph J.; Hatch, Wayne L.; and Tackles, George, 4,798,301, Cl. 215-256.000.
Tada, Tetsuo; and Okada, Keisuke, to VLSI Technology Research Association. Semiconductor testing device. 4,799,009, Cl. 324-158.00P.
Tadokoro, Toyohiko: *See*—
Nagasaki, Yoichi; Nagamoto, Itsushi; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,798,383, Cl. 273-167.00H.
Tagawa, Susumu: *See*—
Ichigaya, Hiroshi; Tagawa, Susumu; Sugii, Yasuoshi; Ando, Masanori; Yamazaki, Jun; Kawada, Yasuo; Kinoshita, Tokuho; Shirahama, Toshio; Ito, Yoshinori; and Munemoto, Eiji, 4,798,992, Cl. 313-406.000.
Taghezout, Daho: *See*—
Tu, Xuan M.; and Taghezout, Daho, 4,799,003, Cl. 322-29.000.
Tague, Steven A.; and Woods, William E., to Honeywell Bull Inc. BCD arithmetic using binary arithmetic and logical operations. 4,799,181, Cl. 364-736.000.
Tahara, Yasuteru: *See*—
Yamamoto, Takashi; Shimada, Katsuhiko; Murata, Ryuji; Tahara, Yasuteru; Terada, Hiromu; and Sakunaga, Kenichi, 4,798,445, Cl. 350-96.340.
Takagi, Isao: *See*—
Saito, Keiji; Takizawa, Yoshiro; and Takagi, Isao, 4,798,704, Cl. 422-99.000.
Takagi, Yuuji: *See*—
Satoh, Isao; Ichinose, Makoto; Fukushima, Yoshihisa; Kuroki, Yuzuru; and Takagi, Yuuji, 4,799,208, Cl. 369-100.000.
Takahashi, Akira: *See*—
Fujikawa, Tetsuzo; Yamaguchi, Yoichi; and Takahashi, Akira, 4,798,082, Cl. 73-117.300.
Takahashi, Ichiro: *See*—
Hayashi, Osamu; Matsuda, Sadamu; Takahashi, Ichiro; Okamoto, Goro; and Okahashi, Kazuo, 4,798,769, Cl. 428-460.000.
Takahashi, Kenji, to Sony Corporation. Disk cartridge having shutters moved by a rack and pinion apparatus. 4,799,121, Cl. 360-133.000.
Takahashi, Masaaki: *See*—
Inoue, Yoshiyuki; Takahashi, Masaaki; Tatekura, Koichi; Nishikawa, Hitoshi; Ohta, Hajime; and Kogure, Yoshikazu, 4,798,969, Cl. 307-112.000.
Takahashi, Shoji: *See*—
Nagano, Makoto; Nakanishi, Akira; Hiraki, Tomoyoshi; Ueno, Akira; Takahashi, Shoji; Kobayashi, Shuhei; Yamamoto, Akihiro; and Kodama, Fumio, 4,798,758, Cl. 428-213.000.
Takahashi, Takeshi; Tsuzuki, Naoyuki; Nohira, Hidetaka; Omori, Yukimitsu; and Takamura, Akio, to Toyota Jidosha Kabushiki Kaisha; and Ono Sokki Co., Ltd. Measuring device for measuring a fuel injection quantity. 4,798,084, Cl. 73-119.00A.
Takamura, Akio: *See*—
Takahashi, Takeshi; Tsuzuki, Naoyuki; Nohira, Hidetaka; Omori, Yukimitsu; and Takamura, Akio, 4,798,084, Cl. 73-119.00A.
Takamura, Yuji: *See*—
Akimoto, Taizo; Akisada, Masahide; Seiki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,799,072, Cl. 354-76.000.
Takanishi, Hiroyoshi: *See*—
Inukai, Shinji; Kuno, Nobuyoshi; Takanishi, Hiroyoshi; and Sasaki, Hiroki, 4,799,135, Cl. 362-296.000.
Takano, Hiroshi: *See*—
Hoshiro, Takeshi; Matsuo, Mu; and Takano, Hiroshi, 4,798,567, Cl. 474-242.000.
Takase, Sadao; Takeda, Hitoshi; and Isobe, Osamu, to Nissan Motor Co., Ltd. Control system for automatic transmission producing shock-free shift. 4,798,105, Cl. 74-866.000.
Take, Hiroshi: *See*—
Takeda, Makoto; Yamamoto, Kunihiko; Matsuhashi, Nobuaki; and Take, Hiroshi, 4,799,057, Cl. 340-811.000.
Take, Minoru: *See*—
Takeda, Tamio; and Take, Minoru, 4,798,087, Cl. 73-649.000.
Takeda Chemical Industries, Ltd.: *See*—
Kato, Koichi; Yamada, Takao; and Kawahara, Kenji, 4,798,886, Cl. 530-416.000.
Takeda, Hitoshi: *See*—
Takase, Sadao; Takeda, Hitoshi; and Isobe, Osamu, 4,798,105, Cl. 74-866.000.
Takeda, Makoto; Yamamoto, Kunihiko; Matsuhashi, Nobuaki; and Take, Hiroshi, to Sharp Kabushiki Kaisha. Circuit for driving a matrix display device with a plurality of isolated driving blocks. 4,799,057, Cl. 340-811.000.
Takeda, Tamio; and Take, Minoru, to Kabushiki Kaisha Kenwood. Inclination detector. 4,798,087, Cl. 73-649.000.
Takeda, Tatsumichi: *See*—
Inoue, Masahide; Ichitsuka, Takeshi; Hirayama, Yasuhiko; Koshikawa, Shozo; Kitaoka, Tateki; Nakabayashi, Nobuo; Takeda, Tatsumichi; and Minoo, Osamu, 4,798,585, Cl. 604-93.000.
Takegahara, Takashi: *See*—
Tanaka, Kunio; Takegahara, Takashi; and Onishi, Yasushi, 4,799,143, Cl. 364-191.000.
Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory device comprising different type memory cells. 4,799,196, Cl. 365-190.000.
Takeuchi, Hiromi: *See*—
Kasai, Kiyoshi; Hattori, Masayuki; Takeuchi, Hiromi; and Sakurai, Nobuo, 4,798,691, Cl. 264-47.000.
Takiguchi, Haruhisa: *See*—
Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,799,227, Cl. 372-46.000.
Takiguchi, Takao; Matsumoto, Masakazu; and Kikuchi, Toshihiro, to Canon Kabushiki Kaisha. Electrophotographic member containing vinylene benzocarazole as charge transporting material. 4,798,777, Cl. 430-59.000.
Takimoto, Kiyoshi: *See*—
Tomida, Yoshinori; Sakai, Kunihiro; Matsuda, Hiroshi; Kawada, Haruki; Eguchi, Ken; Kimura, Toshiaki; Takimoto, Kiyoshi; Saitoh, Kenji; and Miyazaki, Toshihiko, 4,798,740, Cl. 427-43.100.

Takizawa, Yoshiro: *See*—
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Taliani, Laurent: *See*—
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Tamai, Katsuyuki: *See*—
Kawamura, Hideo; and Tamai, Katsuyuki, 4,798,257, Cl. 180-165.000.
Tamaki, Masaru: *See*—
Sakatani, Ikunori; Tanaka, Katsuhiko; and Tamaki, Masaru, 4,798,476, Cl. 384-108.000.
Tanahashi, Hiroshi: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,798,131, Cl. 99-277.200.
Tanaka, Hideo: *See*—
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; and Shiroi, Takashi, 4,798,890, Cl. 540-358.000.
Tanaka, Katsuhiko: *See*—
Sakatani, Ikunori; Tanaka, Katsuhiko; and Tamaki, Masaru, 4,798,476, Cl. 384-108.000.
Tanaka, Kimio; and Shiba, Haruo, to TDK Corporation. Mounting a disc receiver in a disc cartridge. 4,799,122, Cl. 360-133.000.
Tanaka, Kunio; Takegahara, Takashi; and Onishi, Yasushi, to Fanuc Ltd. NC data creation method. 4,799,143, Cl. 364-191.000.
Tanaka, Noriaki, to Mitsubishi Denki Kabushiki Kaisha. Display control apparatus. 4,799,051, Cl. 340-811.000.
Tanaka, Tsuneo: *See*—
Nakamura, Keiichi; Tanaka, Tsuneo; Inaguma, Yoshiharu; and Shiratori, Harunori, 4,798,050, Cl. 60-329.000.
Tanaka, Yasuhiko: *See*—
Asano, Seiji; and Tanaka, Yasuhiko, 4,799,073, Cl. 354-195.120.
Tanashin Denki Co., Ltd.: *See*—
Izumino, Satomi, 4,799,129, Cl. 361-428.000.
Taneya, Mototaka; Matsui, Sadayoshi; and Matsumoto, Mitsuhiro, to Sharp Kabushiki Kaisha. Semiconductor laser array device. 4,799,225, Cl. 372-44.000.
Tanikawa, Isao: *See*—
Nohara, Shigezo; Hirata, Sadao; Matsuo, Junichi; Hirano, Masami; and Tanikawa, Isao, 4,798,697, Cl. 264-255.000.
Tanino, Masaharu; and Hattori, Takemi, to Toyota Jidosha Kabushiki Kaisha; and Aisen Seiki Kabushiki Kaisha. Device for adjusting elevational position of head rest. 4,798,415, Cl. 297-410.000.
Tanoshima, Katsuhide: *See*—
Nagasawa, Hikoshi; Ito, Kazuo; Horii, Shigeru; and Tanoshima, Katsuhide, 4,799,271, Cl. 382-40.000.
Tarling, Stephen R.: *See*—
Miles, Michael; and Tarling, Stephen R., 4,798,079, Cl. 72-391.000.
Tarui, Hisaki: *See*—
Matsuyama, Takao; Tarui, Hisaki; Tsuda, Shinya; Nakano, Shoichi; and Kuwano, Yukinori, 4,799,087, Cl. 357-4.000.
Tatekura, Koichi: *See*—
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Tateyama, Masamitsu: *See*—
Nakai, Yoshio; and Tateyama, Masamitsu, 4,798,867, Cl. 525-196.000.
Taylor, David C.; Springer, William E.; Goeller, Loretta; and Santhouse, Daniel, to Clairol Incorporated. Shock hazard protector for hair dryers. 4,799,124, Cl. 361-42.000.
Taylor, Lawrence D., to Brandt, Inc. Protective circuit for memory devices. 4,799,185, Cl. 364-900.000.
Taylor, Robert J.; and True, Daniel G., to United States of America, Navy. Anchor with folding self-deploying stabilizers. 4,798,159, Cl. 114-295.000.
Taylor, Steven: *See*—
Schaub, Bernhard; and Taylor, Steven, 4,798,555, Cl. 446-310.000.
Tazawa, Toshiaki: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,798,131, Cl. 99-277.200.
TDK Corporation: *See*—
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,799,127, Cl. 361-321.000.
Sakai, Yoshimi; and Satoh, Yoshiki, 4,799,120, Cl. 360-132.000.
Tanaka, Kimio; and Shiba, Haruo, 4,799,122, Cl. 360-133.000.
Teague, Randy: *See*—
Silverman, Lawrence H.; Teague, Randy; and Kaminsky, Richard, 4,799,034, Cl. 333-202.000.
Tecinsky, Jaroslaw. Numerically controlled electromechanical precision drive system. 4,798,999, Cl. 318-45.000.
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Downs, David A.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,798,841, Cl. 514-357.000.
Tecnol, Inc.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,798,199, Cl. 128-87.00R.
Tegart, Harold G. Double ended golf course. 4,798,385, Cl. 273-176.00A.
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Shavit, Eyal; and Teichner, Lester, 4,799,156, Cl. 364-401.000.
Tekip, Gary L.; and Mesko, Charles A. Apparatus for supporting an electronic receiving or sending device on a tripodal tower. 4,799,067, Cl. 343-890.000.
Tektronix, Inc.: *See*—
English, James D., 4,799,020, Cl. 324-79.00R.
Hollister, Allen L.; and Reusa, Edward L., 4,799,165, Cl. 364-487.000.
Telecommunications Radioelectriques et telephoniques T.R.T.: *See*—
Masson, Jacques L. R.; and Picel, Zdenek, 4,799,179, Cl. 364-724.100.
Telectronics N.V.: *See*—
Maddison, David S.; Skalsky, Michael; Milijasevic, Zoran; Perry, Stephen G.; Holley, Loraine K.; Gotthardt, Gerhard R.; and Richardson, Garry T., 4,798,206, Cl. 128-419.00P.
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Djupsjobacka, Anders G., 4,798,429, Cl. 350-96.140.
Telefunken electronic GmbH: *See*—
Mattfeld, Johann; and Sinderhauf, Joachim, 4,799,027, Cl. 330-267.000.
Telenet Communications Corporation: *See*—
Hann, J. David; Holdahl, Theodore S.; and Lum, James C. P., 4,799,153, Cl. 364-200.000.
Terada, Hiromu: *See*—
Yamamoto, Takashi; Shimada, Katsuhiko; Murata, Ryuji; Tahara, Yasuteru; Terada, Hiromu; and Sakunaga, Kenichi, 4,798,445, Cl. 350-96.340.
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Yamazawa, Yasushi; Terada, Masaki; and Tsuchiya, Yasuhiro, 4,798,101, Cl. 74-552.000.
Terasawa, Tsuneo: *See*—
Moriyama, Shigeo; Kurosaki, Toshiei; Terasawa, Tsuneo; Okazaki, Shinji; and Kawamura, Yoshio, 4,798,470, Cl. 356-401.000.
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Yamaguchi, Shuichiro; Ushizawa, Norihiko; and Shimomura, Takeshi, 4,798,664, Cl. 204-418.000.
Terwonne, Rolf-Walter: *See*—
Sturm, Harald; Terwonne, Rolf-Walter; and Thunig, Dieter, 4,798,869, Cl. 525-305.000.
Teshima, Nobue: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; Matsuda, Toshiaki; Ito, Meiji; Kamiguchi, Taiji; Teshima, Nobue; and Akama, Hiroshi, 4,798,813, Cl. 502-60.000.
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Teuco Guzzini S.r.l.: *See*—
Guzzini, Virgilio, 4,797,958, Cl. 4-542.000.
Teutsch, Erich O.: *See*—
Briggs, Milton; and Teutsch, Erich O., 4,798,526, Cl. 425-113.000.
Texaco Inc.: *See*—
Lewis, Paul H.; Dai, Eugene P.; and Holst, Edward H., 4,798,819, Cl. 502-304.000.
Liu, Christopher S.; Grina, Larry D.; and Kapuscinski, Maria M., 4,798,678, Cl. 252-50.000.
Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., 4,798,674, Cl. 210-640.000.
Texas Instruments Incorporated: *See*—
Chauvel, Gerard, 4,799,146, Cl. 364-200.000.
Haight, Michael H.; and Giolma, William H., 4,799,030, Cl. 331-117.00R.
Lin, Kun-Shan; and Goudie, Kathleen M., 4,799,261, Cl. 381-36.000.
Morgan, John D.; Giolma, William H.; and Boucher, Richard, 4,798,973, Cl. 307-296.00R.
Reed, Mark A., 4,799,091, Cl. 357-12.000.
Van Aken, Jerry; and Guttag, Karl, 4,799,053, Cl. 340-703.000.
Verret, Douglas P.; Brighton, Jeffrey E.; Hollingsworth, Deems R.; and Torreno, Manuel L., Jr., 4,799,099, Cl. 357-50.000.
Thannheiser, Axel: *See*—
Jagst, Peter; and Thannheiser, Axel, 4,798,516, Cl. 415-121.00A.
Thayer, Edward B.; Scott, Philip R.; and Roach, Thomas A., to United Technologies Corporation. Area controlled, thrust vectoring vane cascade with nutating control vane. 4,798,328, Cl. 239-1.000.
Theis, Ulrich: *See*—
Prochnow, Jurgen; Peters, Jorg; Theis, Ulrich; and Karius, Klaus D., 4,797,985, Cl. 29-1.210.
Thermos, Michael J.: *See*—
Vaznaian, Dale L.; and Thermos, Michael J., 4,798,190, Cl. 123-531.000.
Thoma, Erhard: *See*—
Laeuppi, Heinrich; and Rapp, Paul, 4,798,495, Cl. 404-100.000.
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Thomas, George. Eye washing method and apparatus. 4,798,599, Cl. 604-290.000.
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Claar, James A.; Thomas, Stephen J.; and Kindle, Betty J., 4,798,746, Cl. 427-407.100.
Martz, Jonathan T.; O'Dwyer, James B.; Thomas, Stephen J.; and Claar, James A., 4,798,745, Cl. 427-407.100.
Thompson, James D., to Hughes Aircraft Company. Reconfigurable beam antenna. 4,799,065, Cl. 343-779.000.
Thomson-C.S.F.: *See*—
Duret, Robert; and Fleury, Georges, 4,798,993, Cl. 313-447.000.

Thomson-CGR: *See*—
Penato, Jean M.; Gabbay, Emile; and Debrouwer, Yves, 4,799,250, Cl. 378-144.000.
THOMSON-CSF: *See*—
de Chambost, Emmanuel, 4,798,953, Cl. 250-310.000.
Laurent, Pierre A., 4,799,241, Cl. 375-113.000.
Rougeot, Henri, 4,799,094, Cl. 357-30.000.
Thomson, Timothy M.; Mattes, M. Jules; Old, Lloyd J.; and Lloyd, Kenneth O., to Sloan-Kettering Institute. Monoclonal antibody specific for a pigmentation associated antigen. 4,798,790, Cl. 435-7.000.
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Ranjith, Heva M. P.; and Thoo, Yin C., 4,798,731, Cl. 426-522.000.
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Sturm, Harald; Terwonne, Rolf-Walter; and Thunig, Dieter, 4,798,869, Cl. 525-305.000.
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Fleischer, Hans-Joachim; Lohscheidt, Klaus; Gorres, Dieter; and Behr, Friedrich, 4,798,631, Cl. 148-3.000.
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Timpl, Rupert; and Brocks, Dietrich, to Max-Planck-Gesellschaft Zur Foederung Der Wissenschaften e.V. Process for isolating human globular domain NC1 of basal membrane collagen from human tissue. 4,798,800, Cl. 435-273.000.
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Maurer, Ruprecht; and Timtner, Karlheinz, 4,798,559, Cl. 464-38.000.
Tingle, Joseph R. Cutting tray. 4,798,372, Cl. 269-59.500.
Tio, Cesario O.: *See*—
Abou-Gharbia, Magid A.; Yardley, John P.; and Tio, Cesario O., 4,798,896, Cl. 546-87.000.
Tischer, Michael: *See*—
Bernhardt, Wolfgang; and Tischer, Michael, 4,798,421, Cl. 303-115.000.
Tittgemeyer, Udo; and Litterst, Thomas, to Interprint Rotatinsdruk GmbH & Co. KG. Color printing method and arrangement. 4,798,136, Cl. 101-181.000.
Tobu Electric Co., Ltd.: *See*—
Tabei, Shigeru, 4,799,038, Cl. 337-379.000.
Todd, Craig C.: *See*—
Mandell, Douglas E.; Todd, Craig C.; Allen, Ioan R.; and Davis, Mark F., 4,799,260, Cl. 381-22.000.
Tofanetti, Odoardo: *See*—
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Otomo, Kikuo; Yamagushi, Masashi; Ito, Masami; and Tokunaga, Hiroki, 4,798,913, Cl. 570-211.000.
Tokuno, Masateru; Sawata, Tetsuya; and Mori, Yasuharu, to Rengo Co., Ltd. Method for positioning tools. 4,798,110, Cl. 83-13.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Bernardi, Richard T., 4,798,540, Cl. 439-22.000.
Bernardi, Richard T., 4,799,245, Cl. 378-15.000.
Yanagi, Hisao, 4,799,040, Cl. 341-101.000.
Tokyo Tanabe Company, Limited: *See*—
Matsuishi, Naoto; Nakagawa, Yoshio; Amano, Michiaki; Kakehi, Norihiko; Kawashima, Toshio; and Omura, Shigeki, 4,798,832, Cl. 514-258.000.
Tolksdorf, Wolfgang F. M.: *See*—
Dammann, Hans O. B.; Pross, Elke B.; Rabe, Gert; Tolksdorf, Wolfgang F. M.; and Zinke, Manfred B., 4,798,434, Cl. 350-96.110.
Tolner, Harm, to U.S. Philips Corporation. Electron beam apparatus comprising an anode which is included in the cathode/Wehnelt unit. 4,798,957, Cl. 250-396.00R.
Tolson, Michael T.: *See*—
Smith, Richard B.; and Tolson, Michael T., 4,799,251, Cl. 379-1.000.
Tomasi, Werner: *See*—
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Tombstone Pizza Corporation: *See*—
Stoerzinger, Charles A.; and Machlett, James, 4,798,014, Cl. 40-124.100.
Tomek, Lawrence S. Oil-absorbent floor mat. 4,798,754, Cl. 428-74.000.
Tomida, Yoshinori; Sakai, Kunihiro; Matsuda, Hiroshi; Kawada, Haruki; Eguchi, Ken; Kimura, Toshiaki; Takimoto, Kiyoshi; Saitoh, Kenji; and Miyazaki, Toshihiko, to Canon Kabushiki Kaisha. Polymerizable film and pattern forming method by use thereof. 4,798,740, Cl. 427-43.100.
Tominari, Kenichi: *See*—
Yoshitake, Junichi; Kitani, Hiroaki; Kashiwa, Norio; Muranaka, Takeshi; Tominari, Kenichi; and Nagamatsu, Shigeki, 4,798,866, Cl. 525-191.000.
Tomiyama, Hideki: *See*—
Idota, Yoshio; Karino, Yukio; Hayashi, Hiroshi; and Tomiyama, Hideki, 4,798,779, Cl. 430-202.000.
Tone, Youichi, to Kabushiki Kaisha Toshiba. Turbine control device. 4,798,513, Cl. 415-17.000.
Tong-Fong Brush Factory Co., Ltd.: *See*—
Fong, James C., 4,797,966, Cl. 15-186.000.
Topcik, Barry, to Union Carbide Corporation. Elastomer polyolefin blends. 4,798,864, Cl. 525-71.000.
Toray Industries, Inc.: *See*—
Itoyama, Kuniyoshi; Horita, Norihiro; Seki, Shigemi; and Minami, Satoyuki, 4,798,875, Cl. 525-444.000.
Kitamura, Hiroshi; and Yamagata, Seiichi, 4,798,748, Cl. 428-15.000.
Okada, Reisuke; and Fujino, Hisami, 4,798,762, Cl. 428-285.000.
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; and Shiroi, Takashi, to Otsuka Kagaku Kabushiki Kaisha. Process for preparation of azetidinone derivatives. 4,798,890, Cl. 540-358.000.
Toro Company, The: *See*—
Waltzer, Bernard; and Moskin, Jeffery M., 4,799,142, Cl. 364-143.000.
Torreno, Manuel L., Jr.: *See*—
Verret, Douglas P.; Brighton, Jeffrey E.; Hollingsworth, Deems R.; and Torreno, Manuel L., Jr., 4,799,099, Cl. 357-50.000.
Torterotot, Roland, to Societe a Responsabilite Limitee: Erca Holding. Metering and dispensing device for the packing of liquids products. 4,798,235, Cl. 141-258.000.
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Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,799,074, Cl. 354-173.100.
Toto Ltd.: *See*—
Sato, Kimiteru; and Ito, Haruyuki, 4,798,525, Cl. 425-84.000.
Toukmanian, Aram H.: *See*—
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Townsend, Carl W.: *See*—
Ludwig, Frank A.; and Townsend, Carl W., 4,798,774, Cl. 429-12.000.
Townsend, Ted H.; Moore, Clinton L.; and Machnicki, John T., to Alfa-Laval Agri, Inc. Electronic identification system. 4,798,175, Cl. 119-155.000.
Toyo Seikan Kaisha: *See*—
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Toyo Stauffer Chemical Co., Ltd.: *See*—
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Toyo Tire & Rubber Company Limited: *See*—
Fukushima, Shigeyoshi; Uno, Hidehiro; and Mimura, Shigetoshi, 4,798,756, Cl. 428-198.000.
Toyoda Koki Kabushiki Kaisha: *See*—
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Toyota Jidosha Kabushiki Kaisha: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; and Nagaoka, Masaaki, 4,798,770, Cl. 428-547.000.
Inuzuka, Yutaka, 4,798,370, Cl. 267-220.000.
Maeda, Yorishige, 4,798,391, Cl. 277-139.000.
Murata, Kiyohito; and Ushijima, Fumihiro, 4,798,272, Cl. 192-70.250.
Nakamura, Keiichi; Tanaka, Tsuneo; Inaguma, Yoshiharu; and Shiratori, Harunori, 4,798,050, Cl. 60-329.000.
Okabe, Yoshio; Kobayashi, Yukimori; Ishikawa, Makoto; Kamiya, Tamotsu; and Atsumi, Tomiaki, 4,798,563, Cl. 474-110.000.
Oomura, Seiji; Fukami, Kashirou; Inagaki, Masao; and Hamamoto, Tooru, 4,798,177, Cl. 12.3-41.120.
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Takahashi, Takeshi; Tsuzuki, Naoyuki; Nohira, Hidetaka; Omori, Yukimitsu; and Takamura, Akio, 4,798,084, Cl. 73-119.00A.
Tanino, Masaharu; and Hattori, Takemi, 4,798,415, Cl. 297-410.000.
Yamazawa, Yasushi; Terada, Masaki; and Tsuchiya, Yasuhiro, 4,798,101, Cl. 74-552.000.
Tozer, Michael J. C., to Heat Transfer Technology Ltd. (Jersey). Hollow metallic sealing ring. 4,798,392, Cl. 277-200.000.
Treene, William E., to Hayward Industries, Inc. Skimmer vacuum filter apparatus. 4,798,670, Cl. 210-169.000.
Tressler, Richard T.; and Boeglin, Herman J., to STEMCOR Corporation. Arsenate dopant sources and method of making the sources. 4,798,764, Cl. 428-312.600.
Triflex Biomarin AB: *See*—
Rosen, Johnny; and Wulff, Par, 4,798,169, Cl. 119-3.000.
Trondsen, John M.: *See*—
Stone, Forrest D.; and Trondsen, John M., 4,798,309, Cl. 221-4.000.
Trost, Stephen A. Tool and process for stimulating a subterranean formation. 4,798,244, Cl. 166-250.000.
Trout, John F., to Lily Corporation. Corner grouting nozzle. 4,798,502, Cl. 450-269.000.
Trout, Torence J.: *See*—
El-Sayed Lyla M.; Schmidt, Steven P.; Trout, Torence J.; and Mitchell, Robert D., 4,798,778, Cl. 430-115.000.
Troutner, Arthur L., to Trus Joist Corporation. Adjustable crossarm spacer and utility line hanger apparatus. 4,798,362, Cl. 248-62.000.
True, Daniel G.: *See*—
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Trumbull, Douglas; Collins, David; Smith, Wayne; and Spieldiener, Robert, to Showscan Film Corporation; and Intamin Corp. Inc. Est. Amusement ride apparatus with a plurality of individually tiltable frames. 4,798,376, Cl. 272-18.000.
Trunzo, James E.: *See—*
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Trus Joist Corporation: *See—*
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Trutek Research, Inc.: *See—*
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Trutzschler GmbH & Co. Kg: *See—*
Jagst, Peter, 4,797,980, Cl. 19-107.000.
Jagst, Peter; and Thannheiser, Axel, 4,798,516, Cl. 415-121.00A.
Leifeld, Ferdinand; and Selker, Hermann G., 4,797,976, Cl. 19-200.000.
TRW United-Carr Limited, Inc.: *See—*
Barnett, Barry R. M.; and Ellis, David C., 4,797,983, Cl. 24-289.000.
Tseng, Hsiaopin: *See—*
Neal, Lewis G.; Haslbeck, John L.; and Tseng, Hsiaopin, 4,798,711, Cl. 423-239.000.
Tseo, Gus G., to Fisher Scientific Group Inc. Diaphragm pump cassette. 4,798,589, Cl. 604-152.000.
Tsubakimoto Chain Company: *See—*
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Tsuboi, Mayumi: *See—*
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Tsubouchi, Kazuo: *See—*
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Tsuchiya, Toshio: *See—*
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Tsuda, Shinya: *See—*
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Tsugaru, Kazunori; and Sugimoto, Yasuhiro, to Kabushiki Kaisha Toshiba. Input circuit. 4,798,981, Cl. 307-475.000.
Tsujinaka, Hisayuki: *See—*
Sano, Tetsuo; Hohki, Tetsuo; Kodama, Eiji; Yoshida, Takumi; Kawatani, Masafumi; and Tsujinaka, Hisayuki, 4,799,175, Cl. 364-552.000.
Tsunashima, Shigeru, to Daidotokushuko Kabushiki Kaisha; and Canon Kabushiki Kaisha. Thermomagnetic recording carrier and a method for thermomagnetic recording. 4,799,114, Cl. 360-59.000.
Tsuruoka, Hisashi: *See—*
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Tsuzuki, Naoyuki: *See—*
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Tu, Xuan M.; and Taghezout, Daho. Mechanical-to-electrical energy converter. 4,799,003, Cl. 322-29.000.
Tucker, Robert E. Sterilizer unit for fluid media and process. 4,798,702, Cl. 422-24.000.
Tung, William C. T.; and Floyd, Merry E., to Goodyear Tire & Rubber Company, The. Modified polyethylene naphthalate. 4,798,883, Cl. 528-272.000.
Turek, Evan J.: *See—*
Scoville, Eugene; Turek, Evan J.; Wragg, Anthony; Cuozzo, Karlina D.; and Rankowitz, Marshall M., 4,798,730, Cl. 426-432.000.
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Turner, Larry G.: *See—*
Crawford, Dennis W.; and Turner, Larry G., 4,798,221, Cl. 137-119.000.
Turner, Leonard O.: *See—*
Kabadi, Ashok N.; Turner, Leonard O.; and White, Michael T., 4,798,918, Cl. 174-36.000.
Turner, Paul F., to BSD Medical Corporation. Hyperthermia apparatus. 4,798,215, Cl. 128-804.000.
Turner, Richard E., deceased: *See—*
Brotzmann, Karl; Fassbinder, Hans-Georg; and Turner, Richard E., deceased, 4,798,624, Cl. 75-38.000.
Turner, Robert B.: *See—*
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Turner, Trenna R., executor: *See—*
Brotzmann, Karl; Fassbinder, Hans-Georg; and Turner, Richard E., deceased, 4,798,624, Cl. 75-38.000.
Twose, David L.: *See—*
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Tyan, Yuan-Sheng: *See—*
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Tyndale Plains-Hunter Ltd.: *See—*
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Tyrell, John A.: *See—*
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Ubelhack, Heinrich: *See—*
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Uclaf, Roussel: *See—*
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Ueda, Kenji, to Omron Tateisi Electronics Co. Circuit resistance adjusting device. 4,799,043, Cl. 340-825.060.
Uehara, Makoto: *See—*
Matsumoto, Koichi; Suenaga, Yutaka; Uehara, Makoto; and Muramatsu, Kiyoyuki, 4,798,962, Cl. 250-548.000.
Ueno, Akira: *See—*
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Igarashi, Sadao; and Ueno, Moriaki, 4,799,033, Cl. 333-134.000.
Ugata, Ken: *See—*
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Ujino, Koji; and Fujioka, Tadashi, to Mita Industrial Co., Ltd. Electrostatic copying apparatus capable of copying on both surfaces. 4,799,079, Cl. 355-14.0SH.
Ultramafic Technology Inc.: *See—*
Morency, Maurice, 4,798,717, Cl. 423-648.100.
Union Carbide Corporation: *See—*
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Reczek, Werner; and Winnerl, Josef, 4,798,974, Cl. 307-296.00R.

Winterhalter, Walter; and Haissig, Andreas, to Gebruder Junghans GmbH. Safety fuse for a spinning-type projectile. 4,798,140, Cl. 102-251.000.

Wisconsin Alumni Research Foundation: *See—*
Belzer, Folkert O.; and Southard, James H., 4,798,824, Cl. 514-60.000.

Wittauer, Gunther: *See—*
Husslein, Julius; Wittauer, Gunther; Knoll, Helmut; and Dandl, Robert, 4,798,938, Cl. 219-395.000.

Witte, Josef: *See—*
Meurer, Kurt P.; Waniczek, Helmut; Sylvester, Gerd; and Witte, Josef, 4,798,873, Cl. 525-333.700.

Wittkopp, Helmut; Gruteser, Helmut; Coenen, Wilfred; and Elschenbroich, Walter, to Wilhelm Hegenscheidt Gesellschaft mbH. Apparatus for monitoring and measuring the quality of rail wheel still mounted beneath a rail vehicle without directly contacting the rail wheels. 4,798,963, Cl. 250-560.000.

Wittmann, Julius: *See—*
Haeussler, Klaus M.; Wittmann, Julius; Gaukel, Gisela; and Auracher, Franz, 4,799,234, Cl. 372-97.000.

Wittur, Olaf: *See—*
Chahabadi, Ziaedin; Brahms, Martin; and Wittur, Olaf, 4,799,138, Cl. 363-21.000.

Witzel, Bruce E., to Merck & Co., Inc. New cyclosporin analogs with modified "C-9 amino acids". 4,798,823, Cl. 514-11.000.

Wolcott, Duane K.; Graves, Ernest D., Jr.; and Hunt, David G., to Dow Chemical Company, The. Method for titration flow injection analysis. 4,798,803, Cl. 436-52.000.

Wolf, Gerhard, to Siemens Aktiengesellschaft. Hybrid associative memory composed of a non-associative basic storage and an associative surface, as well as method for searching and sorting data stored in such a hybrid associative memory. 4,799,149, Cl. 364-200.000.

Wollenberg, Robert H.: *See—*
Plavac, Frank; and Wollenberg, Robert H., 4,798,612, Cl. 44-63.000.

Wolo Manufacturing Corporation: *See—*
Solow, Joseph E., 4,798,066, Cl. 70-212.000.

Wombacher, Ulrich: *See—*
Strzalko, Peter; Walber, Franz-Josef; and Wombacher, Ulrich, 4,799,133, Cl. 362-133.000.

Wong, Gail L.: *See—*
McCormick, Francis P.; Wong, Gail L.; Clark, Robin; Arnheim, Norman; and Nitecki, Danuta E., 4,798,787, Cl. 435-7.000.

Wong, Jesse K.: *See—*
Saksena, Anil K.; Wong, Jesse K.; and Mangiaracina, Pietro, 4,798,842, Cl. 514-381.000.

Wood, Kenneth O.; and Logan, David J., to Gerber Scientific Products, Inc. Apparatus and method for automatic layout of sign text. 4,799,172, Cl. 364-518.000.

Wood, Thomas E.; and Hughes, Henry G., to Motorola Inc. Spin-on glass for use in semiconductor processing. 4,798,629, Cl. 106-287.160.

Woodcock, Stewart J.: *See—*
Eastman, Richard E.; and Woodcock, Stewart J., 4,798,103, Cl. 74-740.000.

Woods, William E.: *See—*
Tague, Steven A.; and Woods, William E., 4,799,181, Cl. 364-736.000.

Wooster Brush Company, The: *See—*
Weiss, Robert L.; Jentes, Charles; and Crowell, Richard J., 4,798,297, Cl. 211-65.000.

Workum, Donald J., to Hafina Treufinanz AG. Container provided with a closure. 4,798,311, Cl. 222-131.000.

Worth, John N.; and Steffensen, Jorn, to W. R. Grace & Co. Dispensing valve with tubular seal. 4,798,314, Cl. 222-542.000.

Wragg, Anthony: *See—*
Scoville, Eugene; Turek, Evan J.; Wragg, Anthony; Cuozzo, Karlina D.; and Rankowitz, Marshall M., 4,798,730, Cl. 426-432.000.

Wretschitsch, Walter: *See—*
Gisler, Barbara; and Tomasi, Werner, 4,798,122, Cl. 84-385.00P.

Wright, Antony P.: *See—*
Baizer, William X.; Bixler, Robert L., Jr.; Meddaugh, Michael D.; and Wright, Antony P., 4,798,818, Cl. 502-228.000.

Wright, James G., Jr.: *See—*
Myers, Daryl L.; and Wright, James G., Jr., 4,798,346, Cl. 242-18.00A.

Wright, Martin A.: *See—*
Crofts, David; and Wright, Martin A., 4,799,125, Cl. 361-91.000.

Wright, Thomas C.: *See—*
Nippoldt, Robert H.; Rocheleau, Gary A.; and Wright, Thomas C., 4,798,197, Cl. 128-25.00R.

Wright, William T. Body massager for alternatively applying rolling pressure or direct pressure. 4,798,198, Cl. 128-57.000.

Wu, Donald P. H. Four-wheeled T-handlebar invalid carriage. 4,798,255, Cl. 180-65.100.

Wulff, Par: *See—*
Rosen, Johnny; and Wulff, Par, 4,798,169, Cl. 119-3.000.

Wurfel, Reinhart: *See—*
Zangenfeind, Helmut; Domges, Gunther; and Wurfel, Reinhart, 4,799,076, Cl. 354-308.000.

Wyeth, Richard W.; Johnson, Michael A.; and Globig, Michael A., to United States of America, Energy. Heterodyne laser instantaneous frequency measurement system. 4,798,467, Cl. 356-349.000.

Wykowski, Paul L.; and Puckett, Paul M., to Dow Chemical Company, The. Epoxy resin compositions for use in low temperature curing applications. 4,798,761, Cl. 428-272.000.

Wyse, Patrick E. Mechanical hackamore. 4,798,043, Cl. 54-6.00R.

X-Flow B. V.: *See—*
Roesink, Hendrik D. W.; Smolders, Cornelis A.; Mulder, Marcellinus H. V.; and Koenhen, Dirk M., 4,798,847, Cl. 521-50.000.

Xerox Corporation: *See—*
Knodt, Ruediger W., 4,799,083, Cl. 355-14.00R.
Streifer, William; Burnham, Robert D.; and Paoli, Thomas L., 4,799,223, Cl. 372-24.000.

Yabe, Hiroko: *See—*
Fujita, Takayuki; Iwasaki, Yoshiya; and Yabe, Hiroko, 4,798,844, Cl. 514-399.000.

Yafuso, Masao; and Hui, Henry K., to Cardiovascular Devices, Inc. Micro sensor. 4,798,738, Cl. 427-2.000.

Yagi, Hiroshi, to Elco Co., Ltd. Abdominal respiration training system. 4,798,538, Cl. 434-262.000.

Yagi, Shigeki: *See—*
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; and Yagi, Shigeki, 4,798,620, Cl. 71-95.000.

Yagi, Toshihiko; and Shimura, Shinya, to Konishiroku Photo Industry Co., Ltd. Process for producing silver halide photographic emulsion. 4,798,775, Cl. 430-569.000.

Yagihara, Morio: *See—*
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Yaguchi, Hiroshi; and Sakamoto, Hiroshi, to Ricoh Company Ltd. Thermosensitive recording material. 4,798,820, Cl. 503-207.000.

Yahagi, Kazuyuki; and Suzuki, Toshio, to Kao Corporation. Hair cosmetic composition comprising submicron polymer particles. 4,798,721, Cl. 424-70.000.

Yahagi, Masahiro: *See—*
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Yamada, Akira: *See—*
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Yamada, Kunimitsu, to Kensetsukiso Engineering Co., Ltd.; and Okabe Co., Ltd. Retaining panel. 4,798,499, Cl. 405-286.000.

Yamada, Masamichi; Kurebayashi, Masaaki; Saito, Masakatsu; Yanagihara, Hitoshi; Konishi, Katsuo; and Tsuchiya, Toshio, to Hitachi, Ltd. Thin film magnetic head. 4,799,118, Cl. 360-125.000.

Yamada, Takao: *See—*
Kato, Koichi; Yamada, Takao; and Kawahara, Kenji, 4,798,886, Cl. 530-416.000.

Yamada, Yasuyuki; and Miyatsuka, Hajime, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,798,755, Cl. 428-141.000.

Yamagata, Seiichi: *See—*
Kitamura, Hiroshi; and Yamagata, Seiichi, 4,798,748, Cl. 428-15.000.

Yamaguchi, Akira, to Fuji Photo Film Co., Ltd. Method of laminating plastic resin sheets. 4,798,639, Cl. 156-73.100.

Yamaguchi, Hiroshi: *See—*
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Yamaguchi, Koshiro: *See—*
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Yamaguchi, Nobuyuki: *See—*
Nanbu, Kazuya; Yamaguchi, Nobuyuki; and Masubuchi, Kaoru, 4,798,354, Cl. 242-84.10R.

Yamaguchi, Noritake: *See—*
Yonezawa, Toshio; Yamaguchi, Noritake; and Okada, Yasutaka, 4,798,632, Cl. 148-12.70N.

Yamaguchi, Shuichiro; Ushizawa, Norihiko; and Shimomura, Takeshi, to Terumo Kabushiki Kaisha. Ion sensor. 4,798,664, Cl. 204-418.000.

Yamaguchi, Tsuyoshi: *See—*
Makino, Toshiyuki; and Yamaguchi, Tsuyoshi, 4,798,920, Cl. 178-19.000.

Yamaguchi, Yoichi: *See—*
Fujikawa, Tetsuzo; Yamaguchi, Yoichi; and Takahashi, Akira, 4,798,082, Cl. 73-117.300.

Yamaguchi, Yoshinori; Nishiyama, Soichi; Maeda, Norihide; and Miyoshi, Masayasu, to Kabushiki Kaisha Mori Seiki Sisakusho. Vertical machining center with a rotary pallet changer. 4,797,990, Cl. 29-568.000.

Yamaguchi, Yoshinori; Nishiyama, Soichi; Maeda, Norihide; and Miyoshi, Masayasu, to Kabushiki Kaisha Mori Seiki Seisakusho. Vertical machining center. 4,797,991, Cl. 29-568.000.

Yamagushi, Masashi: *See*—
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Yamaha Corporation: *See*—
Nagasaki, Yoichi; Nagamoto, Itsushi; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,798,383, Cl. 273-167.00H.
Yamakawa Yakuhin Kogyo Kabushiki Kaisha: *See*—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,798,680, Cl. 252-299.010.
Yamamoto, Akihiro: *See*—
Nagano, Makoto; Nakanishi, Akira; Hiraki, Tomoyoshi; Ueno, Akira; Takahashi, Shoji; Kobayashi, Shuhei; Yamamoto, Akihiro; and Kodama, Fumio, 4,798,758, Cl. 428-213.000.
Yamamoto Chemicals, Inc.: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; and Hosono, Yoichi, 4,798,781, Cl. 430-270.000.
Yamamoto, Hiroshi: *See*—
Kamejima, Kohji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; and Yamamoto, Hiroshi, 4,799,267, Cl. 382-1.000.
Yamamoto, Hisashi; and Maruoka, Keiji, to Toyo Stauffer Chemical Co., Ltd. Optically active 3,3'-disilylbinaphthol derivatives. 4,798,903, Cl. 556-432.000.
Yamamoto, Kunihiko: *See*—
Takeda, Makoto; Yamamoto, Kunihiko; Matsuhashi, Nobuaki; and Take, Hiroshi, 4,799,057, Cl. 340-811.000.
Yamamoto, Motoyuki: *See*—
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Yamamoto, Takashi; Shimada, Katsuhiko; Murata, Ryuji; Tahara, Yasuteru; Terada, Hiromu; and Sakunaga, Kenichi, to Misubishi Rayon Co., Ltd. Plastic optical fiber and process for producing the same. 4,798,445, Cl. 350-96.340.
Yamamoto, Yasuyoshi: *See*—
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Yamamoto, Yuji, to Noritsu Kenkyu Center Co., Ltd. Device for feeding photosensitive material. 4,798,375, Cl. 271-82.000.
Yamana, Tohru; Nakayama, Kiyoshi; and Sato, Kazuhiko, to Murakami Kaimeido Co; and Omuron Tateishi Electronics Co. Control system for foldable outside rearview mirror. 4,798,967, Cl. 307-10.00R.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,798,838, Cl. 514-342.000.
Yamazaki, Jun: *See*—
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Yamazaki, Kaoru: *See*—
Sakamoto, Yoshio; and Yamazaki, Kaoru, 4,799,266, Cl. 381-193.000.
Yamazawa, Yasushi; Terada, Masaki; and Tsuchiya, Yasuhiro, to Toyota Jidosha Kabushiki Kaisha. Core material for steering wheels made of long fiber-reinforced resin. 4,798,101, Cl. 74-552.000.
Yanagi, Hisao, to Tokyo Shibaura Denki Kabushiki Kaisha. Data conversion circuit. 4,799,040, Cl. 341-101.000.
Yanagihara, Hitoshi: *See*—
Yamada, Masamichi; Kurebayashi, Masaaki; Saito, Masakatsu; Yanagihara, Hitoshi; Konishi, Katsuo; and Tsuchiya, Toshio, 4,799,118, Cl. 360-125.000.
Yanaida, Katsuya: *See*—
Sugino, Kenji; Yanaida, Katsuya; Sugino, Hiroshi; Nakaya, Masao; Nishida, Nobuo; and Eda, Kensaku, 4,798,339, Cl. 239-601.000.
Yang, Ji L.: *See*—
Melanson, Ronald J.; and Yang, Ji L., 4,798,972, Cl. 307-270.000.
Yaniger, Stuart I., to Lockheed Corporation. Production of base-type conducting polymers. 4,798,685, Cl. 252-500.000.
Yardley, John P.: *See*—
Abou-Gharbia, Magid A.; Yardley, John P.; and Tio, Cesario O., 4,798,896, Cl. 546-87.000.
Yasuda, Koichi, to Hitachi, Ltd. Apparatus for producing picture tube. 4,798,552, Cl. 445-64.000.
Yasukawa, Eiki; Kihara, Kunio; and Tsuboi, Mayumi, to Mitsubishi Petrochemical Co., Ltd. Solid polymer electrolyte composition. 4,798,773, Cl. 429-192.000.
Yeda Research and Development Company Limited: *See*—
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Yerman, Emil: *See*—
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Yi, Basilio: *See*—
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Yingst, Stephen M.: *See*—
Asick, John C.; Landis, John M.; and Yingst, Stephen M., 4,798,542, Cl. 439-188.000.
Yoe, Craig S.; Gibson, Michael R.; O'Patka, Dennis J.; and Kuna, Wayne A., to Marvin Glass & Associates. User reconfigurable novelty glasses. 4,798,455, Cl. 351-51.000.
Yokota, Takashi: *See*—
Lee, Frank D.; Yokota, Takashi; and Arai, Ken-ichi, 4,798,789, Cl. 435-68.000.
Yokoyama, Kazuaki: *See*—
Kaneko, Tomiatsu; Yokoyama, Kazuaki; and Tsuruoka, Hisashi, 4,798,733, Cl. 426-549.000.
Yokoyama, Michihiro, to Kabushiki Kaisha Yokoyama Seisakusho. Spur gear manufacturing process. 4,797,986, Cl. 29-159.200.
Yonezawa, Toshio; Yamaguchi, Noritake; and Okada, Yasutaka, to Mitsubishi Jukogyo Kabushiki Kaisha. Ni-based alloy and method for preparing same. 4,798,632, Cl. 148-12.70N.
Yoshida, Takumi: *See*—
Sano, Tetsuo; Hohki, Tetsuo; Kodama, Eiji; Yoshida, Takumi; Kawatani, Masafumi; and Tsujinaka, Hisayuki, 4,799,175, Cl. 364-552.000.
Yoshida, Toshihiko: *See*—
Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,799,227, Cl. 372-46.000.
Yoshida, Yasuharu, to NEC Corporation. Clock synchronizing circuit including a voltage controlled oscillator. 4,799,240, Cl. 375-110.000.
Yoshimura, Motokazu, to Brother Kogyo Kabushiki Kaisha. Electronic dictionary system having improved memory efficiency for storage of common suffix words. 4,799,188, Cl. 364-900.000.
Yoshimura, Motokazu, to Brother Kogyo Kabushiki Kaisha. Memory saving electronic dictionary system for spell checking based on noun suffix. 4,799,191, Cl. 364-900.000.
Yoshinaga, Kazuo: *See*—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,798,680, Cl. 252-299.010.
Yoshino, Hirobumi: *See*—
Kikuno, Mitsutoyo; Hirono, Tatsuo; Nakashima, Yoshihiro; and Yoshino, Hirobumi, 4,799,081, Cl. 355-14.00C.
Yoshino, Shoichi: *See*—
Fukuta, Shigemi; Amakasu, Toshinari; Ugata, Ken; and Yoshino, Shoichi, 4,798,615, Cl. 65-4.400.
Yoshino, Tatsuo: *See*—
Akimoto, Taizo; Akisada, Masahide; Seiki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,799,072, Cl. 354-76.000.
Yoshitake, Junichi; Kitani, Hiroaki; Kashiwa, Norio; Muranaka, Takeshi; Tominari, Kenichi; and Nagamatsu, Shigeki, to Mitsui Petrochemical Industries, Ltd. Branched alpha-olefin polymer composition and process for its production. 4,798,866, Cl. 525-191.000.
Yotsumoto, Masahiro: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,798,131, Cl. 99-277.200.
Young, John B.: *See*—
Lokken, Roger C.; and Young, John B., 4,798,025, Cl. 51-168.000.
Yuasa, Satoshi: *See*—
Sugata, Hiroyuki; Nakata, Kouhei; Mizusawa, Nobutoshi; Yuasa, Satoshi; Haruta, Masahiro; Hamamoto, Takashi; and Osabe, Kuniji, 4,798,694, Cl. 264-60.000.
Yugen Kaisha Tokumaru Kogyo: *See*—
Tokumaru, Kaoru, 4,798,453, Cl. 351-41.000.
Yuyama, Takeshi: *See*—
Ackerson, Robert C.; and Yuyama, Takeshi, 4,798,621, Cl. 71-90.000.
Zahnradfabrik Friedrichshafen, AG.: *See*—
Erwin, Piepka; Paul, Wollhaf; and Subhash, Gandbhir, 4,798,504, Cl. 409-2.000.
Fassbender, Rolf, 4,798,256, Cl. 180-133.000.
Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi, 4,799,090, Cl. 357-12.000.
Zangenfeind, Helmut; Domges, Gunther; and Wurfel, Reinhart, to AGFA-Gevaert Aktiengesellschaft. Apparatus for affording access to exposed but undeveloped films in a dark chamber. 4,799,076, Cl. 354-308.000.
Zankich, Frank A.: *See*—
Harmon, Raymond E.; McCown, William R. E.; and Zankich, Frank A., 4,798,408, Cl. 292-341.180.
Zeise, Eric K.; and Ng, Yee S., to Eastman Kodak Company. Dot printer with age compensation means. 4,799,071, Cl. 346-160.000.
Zenker, David L.: *See*—
Meyer, Stephen C.; Lance, Roger L.; Hetzler, Connie L.; Dunkerly, Cedric A., II; Roessler, Thomas H.; Zenker, David L.; and Sciaraffa, Michael A., 4,798,603, Cl. 604-378.000.
Zepke, Bruce E., to Otis Elevator Company. Directional people counting arrangement. 4,799,243, Cl. 377-6.000.
Zimmerman, John M.; and Bishop, Timothy E., to DeSoto, Inc. Ultraviolet curable coatings for optical glass fiber. 4,798,852, Cl. 522-96.000.
Zimmermann, Paul H.: *See*—
Halter, Hartmut; Zimmermann, Paul H.; and Achterwinter, Norbert, 4,798,351, Cl. 242-65.000.
Zinke, Manfred B.: *See*—
Dammann, Hans O. B.; Pross, Elke B.; Rabe, Gert; Tolksdorf, Wolfgang F. M.; and Zinke, Manfred B., 4,798,434, Cl. 350-96.110.
Zipps, Robert H.; Lyons, Kent A.; and Griffin, Evans E., to United Technologies Corporation. Compressor part span shroud. 4,798,519, Cl. 416-191.000.
Zorc, Philip A.: *See*—
Higby, Jeffrey P.; McElroy, Kennedy K.; and Zorc, Philip A., 4,798,548, Cl. 440-78.000.
Zotos International, Inc.: *See*—
Edman, Walter W.; and Klemm, Ernest J., 4,798,722, Cl. 424-72.000.
501 Toppan Moore Company, Ltd.: *See*—
Watanabe, Hiroshi, 4,798,941, Cl. 235-380.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JANUARY, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Chaparral Communications, Inc.: *See*—
Howard, H. Taylor, Re. 32,835, Cl. 333-21.00A.

Comau S.p.A.: *See*—
Corni, Vittorio, Re. 32,837, Cl. 235-375.000.

Cordts, Howard P.; and Karloske, Joan E., to Freeman Chemical Corporation. Aqueous liquid filled polyurethane gels and method of making the same. Re. 32,834, Cl. 524-310.000.

Corni, Vittorio, to Comau S.p.A. Coding systems for elements of machine tools, particularly of the numerically controlled type. Re. 32,837, Cl. 235-375.000.

Coussau, Jean; and Lavaleric, Claude, to Framatome & Cie. Temporary obturation panel of a passage inside a vessel accessible only through an orifice of smaller size. Re. 32,832, Cl. 220-327.000.

Fields, Bernard N.: *See*—
Greene, Mark I.; and Fields, Bernard N., Re. 32,833, Cl. 424-86.000.

Framatome & Cie.: *See*—
Coussau, Jean; and Lavaleric, Claude, Re. 32,832, Cl. 220-327.000.

Freeman Chemical Corporation: *See*—
Cordts, Howard P.; and Karloske, Joan E., Re. 32,834, Cl. 524-310.000.

GKN Automotive Components Inc.: *See*—
Hazebrook, Daniel W., Re. 32,830, Cl. 29-148.40C.

Greene, Mark I.; and Fields, Bernard N., to President and Fellows of Harvard College. Screening vaccines and immunization process. Re. 32,833, Cl. 424-86.000.

Hazebrook, Daniel W., to GKN Automotive Components Inc. Method of forming a precision ball track. Re. 32,830, Cl. 29-148.40C.

Hoppe, Joachim A.: *See*—
Shonrock, Clinton O.; Wambaugh, John O.; and Hoppe, Joachim A., Re. 32,831, Cl. 166-135.000.

Howard, H. Taylor, to Chaparral Communications, Inc. Polarized signal receiver system. Re. 32,835, Cl. 333-21.00A.

Karloske, Joan E.: *See*—
Cordts, Howard P.; and Karloske, Joan E., Re. 32,834, Cl. 524-310.000.

Lavaleric, Claude: *See*—
Coussau, Jean; and Lavaleric, Claude, Re. 32,832, Cl. 220-327.000.

President and Fellows of Harvard College: *See*—
Greene, Mark I.; and Fields, Bernard N., Re. 32,833, Cl. 424-86.000.

Schlumberger Technology Corporation: *See*—
Shonrock, Clinton O.; Wambaugh, John O.; and Hoppe, Joachim A., Re. 32,831, Cl. 166-135.000.

Shonrock, Clinton O.; Wambaugh, John O.; and Hoppe, Joachim A., to Schlumberger Technology Corporation. Apparatus for sealing a well casing. Re. 32,831, Cl. 166-135.000.

Wambaugh, John O.: *See*—
Shonrock, Clinton O.; Wambaugh, John O.; and Hoppe, Joachim A., Re. 32,831, Cl. 166-135.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

BASF Aktiengesellschaft: *See*—
Martin, Wolfgang; Herion, Dieter; Bayew, Dimiter; and Bauer, Wolfgang, B1 4,096,226, Cl. 264-168.000.

Bauer, Wolfgang: *See*—
Martin, Wolfgang; Herion, Dieter; Bayew, Dimiter; and Bauer, Wolfgang, B1 4,096,226, Cl. 264-168.000.

Bayew, Dimiter: *See*—
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Calandra, Frank, Jr., to Jennmar Corporation. Method and apparatus for combining resin bonding and mechanical anchoring of a bolt in a rock formation. B1 4,516,885, 1-17-89, Cl. 405-261.000.

Calandra, Frank, Jr., to Jennmar Corporation. Method and apparatus for combining resin bonding and mechanical anchoring of a bolt in a rock formation. B1 4,518,292, 1-17-89, Cl. 411-82.000.

GTE Products Corporation: *See*—
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Shimizu, Goro; and Kitagawa, Yosuke, B1 4,560,604, Cl. 428-87.000.

Ojanen, Randall W., to GTE Products Corporation. Rotatable cutting bit. B1 4,497,520, 1-17-89, Cl. 299-86.000.

Shimizu, Goro; and Kitagawa, Yosuke, to Matsui Shikiso Chemical Co., Ltd. Method of flocking treatment. B1 4,560,604, 1-17-89, Cl. 428-87.000.

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Andersson, Arne; and Piltz, Lars-Eric. Can. 299,426, 1-17-89, Cl. D9-368.000.

Ansaldo, Albert. Combined swivel chair and firearm support for a sportsman. 299,387, 1-17-89, Cl. D6-335.000.

Aschauer, Joseph G.; and Cuccio, John, to TIE Communications, Inc. Telephone set. 299,458, 1-17-89, Cl. D14-151.000.

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Bajza, Stefan; Strom, Roger A.; and Bajza, Harriet G. Axe-type combination tool. 299,414, 1-17-89, Cl. D8-105.000.
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Barker, Thomas W. Barricade warning light testing device. 299,440, 1-17-89, Cl. D10-77.000.
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Behnk, Bernd D., to Coscom Datentechnik GmbH & Co. Computer KG. Acoustic coupler for transmitting data by way of a telephone. 299,457, 1-17-89, Cl. D14-242.000.
Blewitt, Ruth. Housing for a handset telephone. 299,461, 1-17-89, Cl. D14-248.000.
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Davis, George T. Holder for a shower brush or similar article. 299,423, 1-17-89, Cl. D8-373.000.
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Deflecto Corporation: *See—*
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Demanczyk, John, Sr. Modified crab mallet. 299,404, 1-17-89, Cl. D7-101.000.
Diaz, Juan A., to Reebok International Ltd. Shoe sole material. 299,382, 1-17-89, Cl. D2-320.000.
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Fayerman, Peter S.; and Meck, Leslie A., to Baldwin Hardware Corporation. Combined toothbrush and tumbler holder. 299,397, 1-17-89, Cl. D6-531.000.
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Gustafsson, Nils-Ake, to Sprinter Pack AB. Carrier/package blank. 299,431, 1-17-89, Cl. D9-433.000.
Gustafsson, Nils-Ake, to Sprinter Pack AB. Carrier/package blank. 299,432, 1-17-89, Cl. D9-433.000.
Gustafsson, Nils-Ake, to Sprinter Pack AB. Carrier package blank. 299,433, 1-17-89, Cl. D9-433.000.
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Hedstrom, Norman A., to Wright Line, Inc. Drawer with reference shelf. 299,394, 1-17-89, Cl. D6-510.000.
Helstab, Edmond J., to Northern Telecom Limited. Housing for computer equipment. 299,465, 1-17-89, Cl. D14-114.000.
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Iacovelli, Marc R., to Rally Manufacturing, Inc. Flip up modular compass for automobile control panels. 299,438, 1-17-89, Cl. D10-68.000.
Ikeda, Tameaki, to Sony Corporation. Speech synthesizer activated by reading of a magnetic card. 299,451, 1-17-89, Cl. D14-158.000.
Inglis, Douglas R. Seedling protector. 299,409, 1-17-89, Cl. D8-1.000.
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Jacobs, Melissa N. Arthritic toothbrush. 299,386, 1-17-89, Cl. D4-104.000.
Kicherer, Robert; and Schreder, Felix, to E.G.O. Elektro-Gerate Blanc u. Fischer. Electric hotplate. 299,407, 1-17-89, Cl. D7-367.000.
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Klodt, Gerald J., to W. T. Rogers Company. Pamphlet holder. 299,389, 1-17-89, Cl. D6-407.000.
Klodt, Gerald J., to W. T. Rogers Company. Card file. 299,474, 1-17-89, Cl. D19-76.000.
Klodt, Gerald J., to W. T. Rogers Company. Pencil cup or the like. 299,477, 1-17-89, Cl. D19-85.000.
Klodt, Gerald J., to W. T. Rogers Company. Vertical message file or the like. 299,478, 1-17-89, Cl. D19-90.000.
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Kull, Andrew W. Combined square and tape measure. 299,437, 1-17-89, Cl. D10-62.000.
Kuo, Pei Wen. Telephone set. 299,456, 1-17-89, Cl. D14-151.000.
Kuwa, Kazuhiro; and Yoneda, Kiwamu, to Sumitomo Electric Industries, Ltd. Thermal recorder. 299,435, 1-17-89, Cl. D10-46.000.
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Lippman, Jerome. Fluid dispenser. 299,399, 1-17-89, Cl. D6-545.000.
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Meehan, Kermit E., to Mike Meehan Company, The. Merchandise cooler. 299,391, 1-17-89, Cl. D6-440.000.
Meyer, Stephen T., to Deflecto Corporation. Magnetic-mount paper towel holder. 299,396, 1-17-89, Cl. D6-522.000.
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Pearson, Stanley W. Security bar for protection of pool table coin boxes. 299,421, 1-17-89, Cl. D8-331.000.
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Ronkainen, Jyrki, to Temet Oy. Shock absorber. 299,468, 1-17-89, Cl. D15-141.000.
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Rutty, Edward C., to Stanley Works, The. Belt mounted rule holder. 299,385, 1-17-89, Cl. D3-100.000.
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Chounan, Yoshiya, 299,450, Cl. D12-125.000.
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Takahashi, Tetsuo, to Takigen Manufacturing Co., Ltd. Handle for refrigerator door. 299,416, 1-17-89, Cl. D8-302.000.
Takahashi, Tetsuo, to Takigen Manufacturing Co., Ltd. Handle for refrigerator door. 299,417, 1-17-89, Cl. D8-302.000.
Takahashi, Tetsuo, to Takigen Manufacturing Co. Ltd. Hinge for refrigerator door. 299,418, 1-17-89, Cl. D8-323.000.
Takahashi, Tetsuo, to Takigen Manufacturing Co., Ltd. Hinge for refrigerator door. 299,419, 1-17-89, Cl. D8-329.000.
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Wang, Li-Yu. Adjustable hat buckling belt. 299,380, 1-17-89, Cl. D2-261.000.
Wilfond, Arthur E., to Boyle-Midway Household Products, Inc. Bottle. 299,428, 1-17-89, Cl. D9-373.000.
Williamson, William W.; and Brunius, Robert E., to Interactive Technologies, Inc. Combined annunciator and telephone jack wall plate and a junction box therefor. 299,422, 1-17-89, Cl. D8-353.000.
Wolff, Stephen H. Combined pen/pencil and memo pad holder. 299,476, 1-17-89, Cl. D19-78.000.
Wright Line, Inc.: *See—*
Hedstrom, Norman A., 299,394, Cl. D6-510.000.
Yang, Doo S., to Gold Star Co., Ltd. Video cassette recorder. 299,452, 1-17-89, Cl. D14-135.000.
Yoneda, Kiwamu: *See—*
Kuwa, Kazuhiro; and Yoneda, Kiwamu, 299,435, Cl. D10-46.000.
Zabarte, Ron. Axe. 299,412, 1-17-89, Cl. D8-76.000.

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Asjes, Evert, Jr. Pyramidal English oak named Asjes *Quercus robur*. 6,539, 1-17-89, Cl. 51.000.

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Moore, Ralph S., 6,548, Cl. 2.000.

Chrysantheum Breeders Association NV: *See*—
van der Jagt, Martinus, 6,545, Cl. 74.000.

Fruit Tree Research Station, Ministry of Agriculture, Forestry and Fisheries: *See*—
Nishida, Teruo; Yoshida, Masao; Kyotani, Hidetoshi; Yamaguchi, Masami; and Kozono, Teruo, 6,540, Cl. 42.000.

Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara": *See*—
Holtkamp, Reinhold, Sr., 6,533, Cl. 69.000.
Holtkamp, Reinhold, Sr., 6,534, Cl. 69.000.
Holtkamp, Reinhold, Sr., 6,536, Cl. 69.000.
Koltkamp, Reinhold, Sr., 6,535, Cl. 69.000.

Holtkamp, Reinhold, Sr., to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant named Libra. 6,533, 1-17-89, Cl. 69.000.

Holtkamp, Reinhold, Sr., to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant named Corinna. 6,534, 1-17-89, Cl. 69.000.

Holtkamp, Reinhold, Sr., to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant named Carolyn. 6,536, 1-17-89, Cl. 69.000.

Koltkamp, Reinhold, Sr., to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant named Los Angeles. 6,535, 1-17-89, Cl. 69.000.

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Kyotani, Hidetoshi: *See*—
Nishida, Teruo; Yoshida, Masao; Kyotani, Hidetoshi; Yamaguchi, Masami; and Kozono, Teruo, 6,540, Cl. 42.000.

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Meier, Virgil D.; and Mayer, Eugene W., 6,537, Cl. 88.000.
Meier, Virgil D.; and Mayer, Eugene W., 6,538, Cl. 88.000.

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O. M. Scott & Sons Company, The: *See*—
Meier, Virgil D.; and Mayer, Eugene W., 6,537, Cl. 88.000.
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Serimian, Donald M.; and Serimian, Lionel M. Nectarine tree, Summer Lion—Tree. 6,541, 1-17-89, Cl. 41.000.

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Serimian, Donald M.; and Serimian, Lionel M., 6,543, Cl. 41.000.
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Yoshida, Masao: *See*—
Nishida, Teruo; Yoshida, Masao; Kyotani, Hidetoshi; Yamaguchi, Masami; and Kozono, Teruo, 6,540, Cl. 42.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 17, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

49 R 4,797,952
104 4,797,953
106 4,797,954
213 4,797,955
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CLASS 4

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542 4,797,958
662 4,797,959

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453 4,797,962

CLASS 7

103 4,797,963

CLASS 8

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CLASS 15

186 4,797,966
227 4,797,967
246 4,797,968
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568 4,797,989
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600 4,797,992
613 4,797,993
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87 4,797,998
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339 4,798,000
355 4,798,001

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861.77 4,798,092
862.58 4,798,094
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295 4,798,159

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660.01 4,798,210
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370.01 4,798,958
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CLASS 330

254 4,799,026
267 4,799,027

CLASS 331

57 4,799,028
107 A 4,799,029
117 R 4,799,030

CLASS 333

21 A Re.32,835
22 R 4,799,031
116 4,799,032
134 4,799,033
202 4,799,034
223 4,799,035
260 4,799,036

CLASS 335

46 4,799,037

CLASS 337

379 4,799,038

CLASS 340

333 4,799,039
572 4,799,045
595 4,799,046
618 4,799,047
626 4,799,048
703 4,799,053
709 4,799,049
710 4,799,054
4,799,055
765 4,799,050
799 4,799,056
811 4,799,051
4,799,057
4,799,058
825.06 4,799,043
825.34 4,799,061
825.5 4,799,052
870.03 4,799,059
907 4,799,060

CLASS 341

5 4,799,044
101 4,799,040
118 4,799,042
120 4,799,041

CLASS 342

450 4,799,062

CLASS 343

703 4,799,063
766 4,799,064
779 4,799,065
861 4,799,066
890 4,799,067

CLASS 346

1.1 4,799,068
108 4,799,069
159 4,799,070
160 4,799,071

CLASS 350

1.1 4,798,427
3.7 4,798,426
96.11 4,798,434
96.13 4,798,435
96.14 4,798,429
4,798,437
96.15 4,798,436
4,798,438
96.18 4,798,428
96.2 4,798,441
96.20 4,798,430
4,798,431
4,798,432
4,798,439
4,798,440
96.21 4,798,433
4,798,442
96.23 4,798,443
96.24 4,798,444
96.34 4,798,445
162.23 4,798,446
255 4,798,447
345 4,798,448
358 4,798,449
505 4,798,450
522 4,798,451
632 4,798,452

CLASS 351

41 4,798,453
50 4,798,454
51 4,798,455
222 4,798,456
235 4,798,457
242 4,798,458

CLASS 354

76 4,799,072
173.1 4,799,074
195.12 4,799,073
289.1 4,799,075
308 4,799,076
400 4,799,077
412 4,799,078

CLASS 355

3 DD 4,799,086
7 4,799,080
14 C 4,799,081
14 R 4,799,082
4,799,083
14 SH 4,799,079
4,799,084
27 4,799,085

CLASS 356

124 4,798,460
127 4,798,459
138 4,798,461
152 4,798,462
318 4,798,463
328 4,798,464
336 4,798,465
347 4,798,466
349 4,798,467
351 4,798,468
376 4,798,469
401 4,798,470

CLASS 357

4 4,799,087
12 4,799,090
4,799,091
16 4,799,088
23.12 4,799,092
23.6 4,799,093
30 4,799,094
38 4,799,095
42 4,799,096
4,799,097
43 4,799,098
45 4,799,089
50 4,799,099
52 4,799,100
59 4,799,101

CLASS 358

23 4,799,102
88 4,799,103
98 4,799,104
160 4,799,105
168 4,799,106
169 4,799,107
213.26 4,799,108
213.28 4,799,109
261.3 4,799,110

CLASS 360

14.3 4,799,111
31 4,799,112
32 4,799,113
59 4,799,114
66 4,799,115
74.1 4,799,116
96.5 4,799,117
123 4,799,119
125 4,799,118
132 4,799,120
133 4,799,121
4,799,122
4,799,123

CLASS 361

42 4,799,124
91 4,799,125
101 4,799,126
321 4,799,127
414 4,799,128
428 4,799,129
437 4,799,130

CLASS 362

61 4,799,131
118 4,799,132
133 4,799,133
217 4,799,134
296 4,799,135
300 4,799,136
309 4,799,137

CLASS 363

21 4,799,138
95 4,799,139

CLASS 364

140 4,799,140
141 4,799,141
143 4,799,142
191 4,799,143
200 4,799,144
4,799,145
4,799,146
4,799,147
4,799,148
4,799,149
4,799,150
4,799,151
4,799,152
4,799,153
4,799,154
4,799,155
401 4,799,156
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424.06 4,799,159
424.1 4,799,158
4,799,160
426.01 4,799,161
436 4,799,162

457 4,799,163
487 4,799,165
497 4,799,166
507 4,799,167
4,799,168
510 4,799,169
513 4,799,170
513.5 4,799,171
518 4,799,172
4,799,173
550 4,799,174
552 4,799,175
557 4,799,176
563 4,799,177
565 4,799,178
724.1 4,799,179
724.2 4,799,180
736 4,799,181
748 4,799,182
760 4,799,183
821 4,799,184
900 4,799,185
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4,799,187
4,799,188
4,799,189
4,799,190
4,799,191

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49 4,799,192
149 4,799,193
154 4,799,194
185 4,799,195
190 4,799,196
205 4,799,197
221 4,799,198
230 4,799,199

CLASS 366

65 4,798,471
89 4,798,472
4,798,473
160 4,798,475

CLASS 367

30 4,799,200
41 4,799,201
149 4,799,202

CLASS 368

27 4,799,203
263 4,799,204

CLASS 369

43 4,799,205
44 4,799,206
58 4,799,207
75.2 4,799,209
100 4,799,208
110 4,799,210

CLASS 370

17 4,799,211
20 4,799,212
30 4,799,213
32.1 4,799,214
60 4,799,215
67 4,799,216
68.1 4,799,217
85 4,799,218
94 4,799,219

CLASS 371

25 4,799,220
38 4,799,221
51 4,799,222

CLASS 372

24 4,799,223
38 4,799,224
44 4,799,225
45 4,799,226
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70 4,799,233
97 4,799,234

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18 4,799,235
45 4,798,477

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36 4,799,236
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56 4,799,238
88 4,799,239
110 4,799,240
113 4,799,241
122 4,799,242

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338 4,798,700

CLASS 377

6 4,799,243
58 4,799,244

CLASS 378

15 4,799,245
50 4,799,246
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114 4,799,248
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144 4,799,250

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97 4,799,254
189 4,799,255
269 4,799,256

CLASS 380

9 4,799,257
21 4,799,258
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22 4,799,260
36 4,799,261
43 4,799,262
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27 4,799,269
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216.1 4,798,489
223 4,798,487
697.1 4,798,490

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223 4,798,492
404 4,798,493

CLASS 404

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114 4,798,494

CLASS 405

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158 4,798,500
186 4,798,497
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260 4,798,501
261 B1 4,516,885
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2 4,798,504
136 4,798,505
179 4,798,506

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82 B1 4,518,292
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686 4,798,511
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CLASS 417

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363 4,798,522
407 4,798,523

CLASS 420

528 4,798,701

CLASS 422

24 4,798,702
63 4,798,705
65 4,798,703
99 4,798,704
102 4,798,706
264 4,798,707

CLASS 423

55 4,798,708
63 4,798,709
69 4,798,710
239 4,798,711
315 4,798,712
342 4,798,713
344 4,798,714
478 4,798,715
574 R 4,798,716
647 4,798,718
648.1 4,798,717

CLASS 424

1.1 4,798,719
61 4,798,720
70 4,798,721
72 4,798,722
86 Re.32,833
93 4,798,723
456 4,798,725
480 4,798,724

CLASS 425

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84 4,798,525
113 4,798,526
145 4,798,527
190 4,798,528
289 4,798,529

CLASS 426

40 4,798,726
69 4,798,727
129 4,798,728
326 4,798,729
432 4,798,730
522 4,798,731
542 4,798,732
549 4,798,733
565 4,798,734
578 4,798,735
602 4,798,737
656 4,798,736

CLASS 427

2 4,798,738
38 4,798,739
43.1 4,798,740
213.33 4,798,741
240 4,798,742
255 4,798,743
389.9 4,798,744
407.1 4,798,745
4,798,746

CLASS 428

12 4,798,747
15 4,798,748
34.9 4,798,751
36 4,798,752
36.5 4,798,749
36.7 4,798,750
69 4,798,753
74 4,798,754
87 B1 4,560,604
141 4,798,755
198 4,798,756
4,798,757
213 4,798,758
220 4,798,759
234 4,798,760
272 4,798,761
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312.6 4,798,764
336 4,798,765
373 4,798,815
404 4,798,766
412 4,798,767
426 4,798,768
460 4,798,769
547 4,798,770
564 4,798,771
600 4,798,772

CLASS 429

12 4,798,774
192 4,798,773

CLASS 430

39 4,798,776
59 4,798,777
115 4,798,778
202 4,798,779
264 4,798,780
270 4,798,781
4,798,782
372 4,798,783
382 4,798,784
495 4,798,785
569 4,798,775

CLASS 431

12 4,798,531
354 4,798,530

CLASS 432

210 4,798,532
227 4,798,533

CLASS 433

6 4,798,534
101 4,798,535
212.1 4,798,536

CLASS 434

90 4,798,537
262 4,798,538
319 4,798,539
323 4,798,543

CLASS 435

7 4,798,787
4,798,790
37 4,798,788
68 4,798,789
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134 4,798,793
177 4,798,786
4,798,795
212 4,798,796
235 4,798,797
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254 4,798,799
273 4,798,800
313 4,798,801
4,798,802

CLASS 436

52 4,798,803
94 4,798,804
157 4,798,805
548 4,798,806
4,798,807

CLASS 437

4 4,798,808
4,798,809
29 4,798,810
41 4,798,794
119 4,798,812

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22 4,798,540
67 4,798,541
188 4,798,542
404 4,798,544
677 4,798,545
830 4,798,546

CLASS 440

66 4,798,547
78 4,798,548

CLASS 441

74 4,798,549
129 4,798,550
130 4,798,551

CLASS 445

64 4,798,552

CLASS 446

99 4,798,553
222 4,798,554
310 4,798,555
391 4,798,556

CLASS 450

31 4,798,557
269 4,798,502

CLASS 453

32 4,798,558

CLASS 464

38 4,798,559
178 4,798,560

CLASS 474

28 4,798,561
101 4,798,562
110 4,798,563
134 4,798,564
158 4,798,565
238 4,798,566
242 4,798,567
4,798,568
255 4,798,569

CLASS 493

44 4,798,570
114 4,798,571
195 4,798,572
196 4,798,576
204 4,798,573
267 4,798,574
338 4,798,581
346 4,798,575

CLASS 494

18 4,798,579
67 4,798,577

CLASS 501

89 4,798,814

CLASS 502

60 4,798,813
62 4,798,816
217 4,798,817
228 4,798,818
304 4,798,819

CLASS 503

207 4,798,820

CLASS 514

9 4,798,821
11 4,798,823
60 4,798,824
65 4,798,825
159 4,798,811
183 4,798,827
192 4,798,828
214 4,798,829
221 4,798,826
253 4,798,831
258 4,798,832
262 4,798,833
288 4,798,834
314 4,798,830
342 4,798,838
351 4,798,839
356 4,798,840
357 4,798,841
369 4,798,835
381 4,798,842
392 4,798,843
399 4,798,844
400 4,798,845
594 4,798,837
731 4,798,846

CLASS 521

50 4,798,847
89 4,798,848
114 4,798,849
134 4,798,850
137 4,798,851

CLASS 522

96 4,798,852

CLASS 523

173 4,798,853
334 4,798,854
435 4,798,855

CLASS 524

89 4,798,836
93 4,798,857
100 4,798,858
310 Re.32,834
386 4,798,856
409 4,798,860
413 4,798,863
458 4,798,861
783 4,798,862

CLASS 525

7 4,798,859
71 4,798,864
92 4,798,865
191 4,798,866
196 4,798,867
207 4,798,868
305 4,798,869
327.1 4,798,870
328.2 4,798,871
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425 4,798,874
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531 4,798,877

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28 4,798,878
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63 4,798,880
73 4,798,881
190 4,798,882
272 4,798,883
491 4,798,884

CLASS 530

350 4,798,885
416 4,798,886

CLASS 534

637 4,798,887

CLASS 536

123 4,798,888

CLASS 540

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472 4,798,891

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41 4,798,895
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262 4,798,899
461 4,798,900
562 4,798,901

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54 4,798,902
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432 4,798,903

CLASS 558

186 4,798,872
254 4,798,904

CLASS 560

16 4,798,905

CLASS 562

583 4,798,907

CLASS 564

153 4,798,908
334 4,798,909
497 4,798,910

CLASS 568

614 4,798,906
637 4,798,912
747 4,798,911

CLASS 570

211 4,798,913
226 4,798,914

CLASS 585

833 4,798,915

CLASS 604

4 4,798,578
30 4,798,580
47 4,798,582
48 4,798,583
49 4,798,592
93 4,798,584
4,798,585
96 4,798,586
110 4,798,587
122 4,798,588
152 4,798,589
153 4,798,590
164 4,798,591
4,798,593
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174 4,798,595
218 4,798,596
270 4,798,597
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290 4,798,599
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368 4,798,601
372 4,798,602
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411 4,798,605

CLASS 623

1 4,798,606
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6 4,798,608
4,798,609
22 4,798,610
66 4,798,611

CLASSIFICATION OF DESIGNS

D2—	261	299,380		531	299,397		105	299,414			299,431		123	299,448		248	299,461
	318	299,381		540	299,398		302	299,415			299,432		125	299,449	D15—	130	299,466
	320	299,382		545	299,399			299,416			299,433			299,450		131	299,467
	605	299,383		572	299,400			299,417		435	299,434	D14—	100	299,463		141	299,468
D3—	53	299,384	D7—	43	299,401		323	299,418	D10—	46	299,435			299,464			299,469
	100	299,385		73	299,402		329	299,419		62	299,436		114	299,465	D17—	20	299,453
D4—	104	299,386		98	299,403			299,420			299,437		135	299,452	D19—	43	299,470
D6—	335	299,387		101	299,404		331	299,421		68	299,438		147	299,462		49	299,471
	349	299,388		105	299,405		353	299,422		75	299,439		151	299,456		60	299,472
	407	299,389		332	299,406		373	299,423		77	299,440			299,458			299,473
	436	299,390		367	299,407		499	299,424	D11—	152	299,441			299,459		76	299,474
	440	299,391			299,408			299,425		153	299,442			299,460		78	299,475
	479	299,392	D8—	1	299,409	D9—	368	299,426			299,443		158	299,451			299,476
	503	299,393		52	299,410		370	299,427			299,444		205	299,454		85	299,477
	510	299,394		68	299,411		373	299,428			299,445		240	299,455		90	299,478
	511	299,395		76	299,412		413	299,429	D12—	110	299,446		242	299,457	D22—	199	299,479
	522	299,396		97	299,413		433	299,430			299,447						

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P.—	2	6,548		41	6,541			6,544		69	6,533			6,536		88	6,537
	7	6,546			6,542		42	6,540			6,534		74	6,545			6,538
	10	6,547			6,543		51	6,539			6,535						

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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02 : 4,798,390
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PLANT PATENTS

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6,542

6,543
6,544

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29 : 6,539

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